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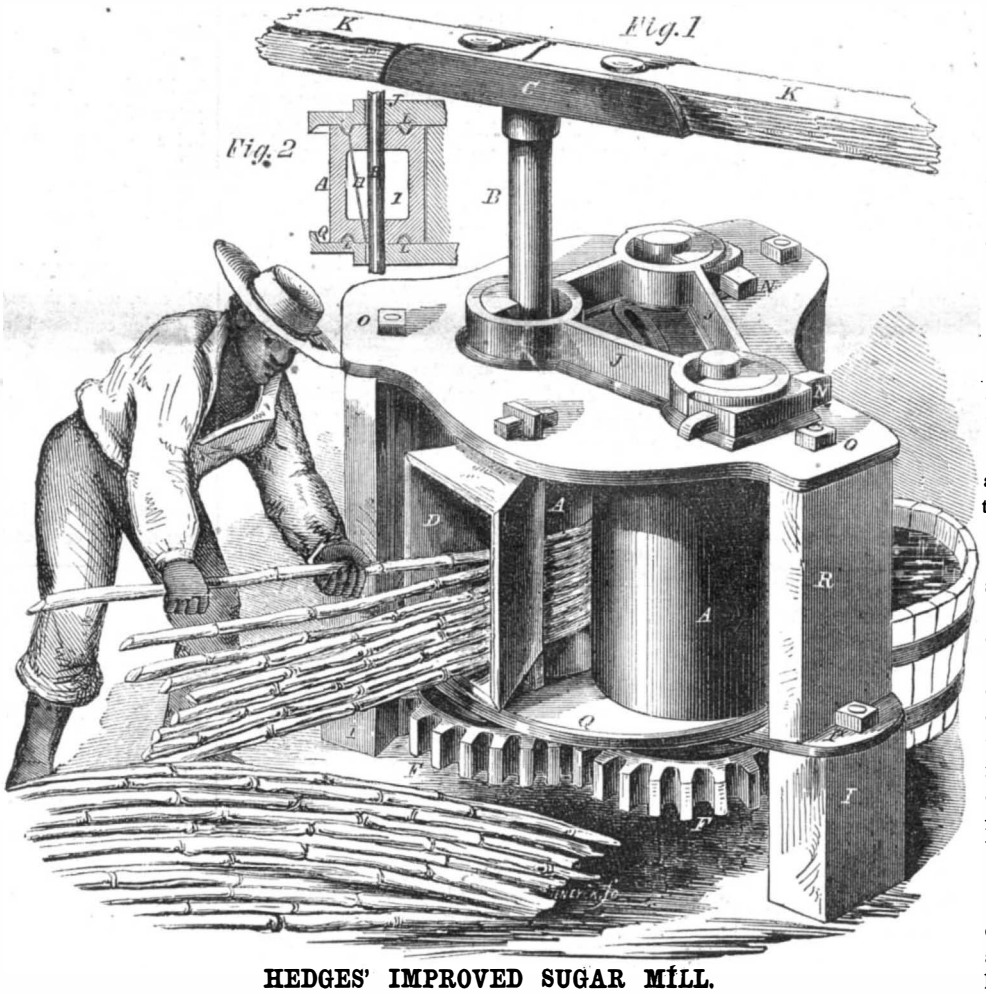
IMPROVED SUGAR MILL.

The manufacture or extraction of sugar is a matter of such great importance to this country that every improvement which tends to simplify or cheapen the processes should be tried by those interested, and, if successful, adopted. The improvement that we have illustrated is the mill invented by Isaac A. Hedges, of Cincinnati, Ohio, and patented Feb. 1, 1859. The following condensation of his claims will give some idea of his invenvention. He claims surrounding the openings in the top and bottom plates with annular ledges, when employed in connection with rollers having corresponding recesses; also a regulator and adjuster, and oil tubes in the rollers, when used in connection with a recess containing waste oil, to conduct the oil to the bearing below; and lastly, corrugated shells, for the purpose of readily converting the mill into a corrugated one.

Fig. 1 is a perspective view of the invention, and Fig. 2 is a vertical section of a roller showing the annular ledges in the frame, the recess in the roller, and the oil tube. A A are the rollers of any suitable length and diameter made of cast iron and turned. B is the main shaft, and C is the flanged center, carrying the sweep, K. D is the regulator and adjuster. The rollers, A, are connected by gear wheels, F, underneath, and there is a spout for conducting off the juice after it has been expressed by the rollers. H are the oil tubes leading from the recesses in the upper ends of the rollers, where the waste oil is collected, and conducting it to the journals and gearing below. The whole stands on legs, I, of heavy timber, to which the lower plate is bolted by bolts, P. L are the ledges surrounding the openings in the top and bottom plates, and accommodated by corresponding recesses in the ends of the rollers.



HEDGES' IMPROVED SUGAR MILL.

There is a scraper between the rollers, by which the partially compressed cane is separated from the right hand roller, and conducted around between the main and rear rollers which are somewhat closer together than the former pair, and so compress the cane closer, thereby extracting all the juice. The keys, N, by which the rollers can be brought close together, or the distance between them increased, are on the top, and they act in appropropriate bearings in the bearing boxes, J, of the rollers. The top is secured to the framing, R, by bolts and nuts, O; and Q is a flange on the bottom plate, to retain the piece, and direct it to the spout.

When the mill is required to be used for grinding with corrugated cylinders, the rollers are removed, and two of them are clothed with corrugated shells which fit perfectly by means of a lug on the ends of the shells and a recess in the roller. These two rollers are then replaced in the mill, and the hopper adjusted to suit the new arrangement.

These mills can be made to be used either vertically or horizontally, and they are manufactured by Hedges, Free & Co., of No. 6 Main-street, Cincinnati, who will be happy to furnish any further information.

BETHEL'S PROCESS FOR PRESERVING WOOD.

The mere external application of any solution or mixture, either by steeping or painting, can never be effective in preserving wood from that species of decay which is found in the heart of timber. But the process proposed by Mr. J. Bethel, of England, for rendering wood more durable, less pervious to water, etc., consists in a mode of impregnating the wood to the center and saturating it throughout its whole substance with various solutions and mixtures, which have the effect of coagulating the sap, and thus preventing its putrefaction. But for wood that will be much exposed to the weather, and alternately wet and dry, the mere coagulation of the sap is not sufficient; for although the albumen contained in the sap of the wood is the most liable and the first to putrefy, yet the ligneous fiber itself, after it has been deprived of all sap, will, when exposed to a warm, damp situation, rot and crumble into dust. To preserve wood, therefore, that will be much exposed to the weather, or to a warm and damp situation, it is not only neaessary that the sap should be coagulated, but that the fibres should be protected from moisture. This Mr. Bethel effects by impregnating the wood throughout its whole substance with oil of creosote mixed with tarry bituminous matters. The creosote coagulates the albumen, and the tarry and bituminous matters fill up every pore and form, a water-proof covering to the fibres of the wood.

TREATMENT OF PHTHISIS.—Dr. Flint gives an account, in the *American Journal of Medical Science*, of his treatment of phthisis. Out of 14 cases in which arrest of pythisis took place, in eight there was a complete change in the habits of life—not simply gentle walks or drives, but rough occupations, involving considerable and sometimes great exposure to vicissitudes of weather.—Change of climate only seems to be directly beneficial, inasmuch as it gives more inducement to exercise. Dr. F. thinks that patients should live generously, taking especially highly carbonaceous food, the free use of sugar; also of wine, and other diffusible stimuli, which are of great use. Except, perhaps, cod-liver oil, no medicinal agents seem to act beyond mere palliatives. There are various conditions of the throat met with in phthisis. In the earlier stages, the patient complains of dryness of the throat and cough, and on examination the throat is found smooth and shining and the parts attenuated. It is a state of lessened strength without inflammatory action. A useful means of treatment here, according to Dr. Flint, is the application of a mixture of equal parts of chloroform and olive oil, by means of a large brush. Great relief is obtained by the application of a strong solution of nitrate of silver to the fauces, by means of a large brush.

NEW FILE-CUTTING MACHINE. — Messrs. Greenwood and Batley, of Leeds, England, have been exhibiting a patent file-cutting machine, recently imported from France. The file is placed upon a self-adjusting bed, capable of being turned in any direction, and the chisel or cutting instrument is fixed in a vertical slide, actuated by a spring and a cam, and giving about 1,000 blows per minute. The machine is perfectly under the control of the workman, and occupies very little room; and it is stated that while it produces better files than can be made by hand-labor, it will do ten or twelve times as much work as an ordinary skilled workman. The machine is already in operation in France and Belgium, and it is reported that it is intended to establish a joint-stock company to carry out at Leeds the manufacture of files by this process.

The curvature of the earth amounts to seven inches per mile. A man 6 feet high cannot be seen 10 miles.

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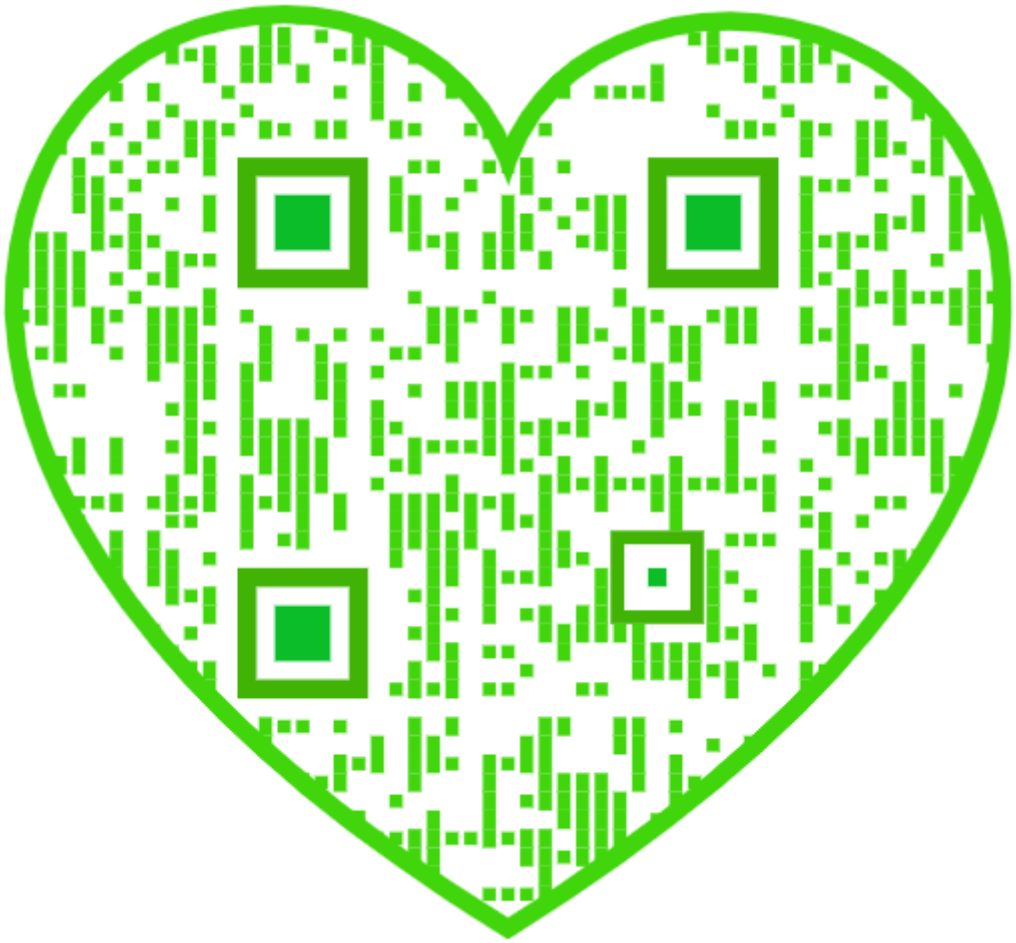

WOOD-BENDING.

The greater number of articles of bent wood produced by machinery have not been compressed to less than one-twelfth of their original bulk, but, with proper treatment, wood may easily be compressed one-sixth of its bulk in bending, and be in better condition for use. A stick of timber 42 inches long (when straight) and nine inches square, bent over an arc equal to one-fourth of a circle, described by a radius of 12 inches, has its side of the inner curve shortened 14 inches, just one-third of its whole length, and the exact difference in the lengths of the outer and the inner curves proper. The area of the cross section of the timber, multiplied by one-half the amount of reduction in length of the side of the inner curve when there has been no distention, gives, in this case, one-sixth as the amount of compression. Such heavy bending requires the employment of machinery adapted to form the curve, by beginning in the middle of its length and bending both ends toward each other, in order to distribute the compression more equally in all the parts of the length of the wood, which otherwise would be more confined to the parts about the curve proper. The first wood-bending patent granted in the United States was, it is said, for a method of bending heavy timbers for boats and vessels; the mechanical devices employed to contract one side and protect the other, of the "lesser and greater curves" were, and are, common but curious in their application. The preparatory treatment of the wood for bending was peculiar and advantageous, consisting in repeated manipulation and steaming, "to cause more thorough permeation of the steam and heated moisture among the particles of the wood," to soften and qualify it for being bent, before subjecting it to the final process—pressure.

In evidence of the practicability of such wood-bending, heavier timbers are now bent with more success since the employment of machinery adapted to begin the curve in the middle of its length; and the superiority of such bent timbers over those of the natural growth, and those hewn into shape has, after the severest scientifiic and practical tests, been acknowledged.

The cause of the very limited use at present of such heavy bent timbers, while other timbers are so extensively used, must be attributed to the great cost of the production of such timbers by the use of the present machinery, and not the supposed unfitness of wood to be bent successfully beyond the sizes of timbers and shortness of curves most in common use.

The capability of such woods as are bent into artificial shapes, to be thus treated, is owing to the tenacity of the fibers alone, or a force of compression acting endwise throughout the length of the wood, which in its natural state offers the least resistance, while being bent, to the action of forces tending to compress it endwise. When wood is properly treated for bending, this resistance is lessened and the wood becomes more compressible, and better suited for that permanent compression which is the common effect produced in all wood that is bent and constrained as bent. A stick of wood bent by hand across the knee, or as the archer bends the bow, without any other restraint of tension or force of compression than is afforded by the natural properties and structure of the wood, has the side of its outer curve less elongated than the inner curve becomes shortened; the movement and change of arrangement among the fibers of wood is always more extensive under the effect of compression than under the effect of stretching; and always less hurtful to the structure of the wood whether compression be equally distributed in the length of the wood or not.

It is found in practice that the greatest amount of compression in wood by bending it, is best effected when the slip of the fibers in the whole length of the wood is directed into lines tending toward the desired curve, by forming the wood into a long curve at the outset of the bending process to receive the compressing power, and this, while the long curve is being gradually contracted to the shape of the mold, as the bending advances to completion. The continued steady action of the compressing power upon the wood while it is in the form of a yielding curve, compels the greatest amount of the slip of the fibers, and changes the general structure of the wood from that of the cellular and fibrous to fibrous alone. The friction arising from the slip of the fibers and the crushing of the cells increases the heated condition of the wood, until the process is completed; this favorable effect, together with that of the heated moisture as it is expelled from the crushed cells, and forced more thoroughly among the fibers, softens the wood, reduces the resistance, and facilitates compression to an extent not attained in any method of bending wood that does not begin the curve in the middle of its length.

* * * * * *

The structure and qualities of wood admit of its being bent by any proper machinery that assists compression, and, however, such machinery may accomplish the bending, the effect upon the wood bent is identically the same in every respect and condition, but that of degree or extent.

In regard to any particular method or machinery for bending wood to the best advantage, I have only to add, that an extended effort to learn what had been done and attempted in the art, together with some practical familiarity with it, have suggested the above, under the belief that all wood-bending machinery may very properly be comprised in two general classes; the one, that in which the curve is begun to be formed at one end, and the bending is effected by moving molds; the other, that in which the curve is begun to be formed in the middle, and the bending is effected by other means around stationary molds. The moving molds of the one and the bending from the middle of the other have recently been united, and operated with some success.

JOHN C. MORRIS.

Cincinnati, July, 1859.

PRESERVING AND COLORING WOOD AND MARBLE.

A patent has recently been taken out in England, by W. Clark, embracing the above-named features, and for many purposes the invention appears to be very useful. The wood to be treated is first submitted to an injection of the silicate of zinc in solution, which renders it homogeneous. This silicate is insoluble in acids and mineral salts, and it closes up the pores of the wood. The impregnation by this process is executed in a close and strong iron vessel, and the fluid is forced into the pores of the timber by a pump. The operation is completed when the gage indicates a pressure of 20 atmospheres for soft wood, and 60 for hard wood. The second operation consists in removing the sap of the wood, and for this purpose the patentee employs caustic lye, which permeates the juices of the wood, the application of the lyes and the washing being repeated several times. To obtain delicate colors the wood is made to undergo a bleaching processs after which operation the wood being charged with color acquires light tints and hardness according to the presence of different salts. To preserve woods he removes the sap as above indicated before submitting them to an injection of the sulphate of copper and sulphuret of sodium, the combination resulting from the action of these two substances being insoluble in water. Wood thus prepared is not susceptible of warping or shrinking, and is readily colored. To assist the passage of the liquids injected into the wood, he also employs at one end of the timber an air pump, which also assists the dessication. For coloring marble he employs the same apparatus, but modifies the parts which serve to hold the wood. The marble is submitted to an injection of citric acid diluted in water in order to open the pores. After this operation the marble may be colored.

THE FOUNDATIONS OF HOUSES.

The nature and condition of the soil upon which houses are to be built should receive far more attention than is usually bestowed upon such subjects. A soil which is spongy and damp, or contains much loose organic matter, is generally unhealthy; whereas a dry, porous soil affords a healthy site for buildings. Thus a compact sand and gravel soil, like that upon which the greater part of the city of New York is built, is very favorable to health, because it has sufficient porosity to allow surface-water to penetrate into it, and to carry off organic matter to undergo oxydization without causing malarious vapors. Wherever we find a soil deficient in gravel or sand, or where gravel and sand-beds are underlaid with clay, there should be a thorough sub-soil drainage, because the clay retains the water, and a house built in such a spot would otherwise always be damp and unhealthy.

When the sub-soil is swampy, which is the case with many portions of various cities that have been filled in with what is called *made earth*, fever is liable to prevail in houses built in such localities, owing to the decay of organic matter underneath, and its ascension in the form of gas through the soil. When good drainage cannot be effected in such situations, and it is found necessary to build houses on them, they should all have solid floors of concrete, laid from the outside of the foundations and covering the whole area over which the structure is erected. The old Romans, who were exceedingly sensible persons in all that related to houses, made all their buildings with concrete floors, and over each of these a flooring of tiles was laid. These floors tended to prevent dampness in their houses, consequently they were more comfortable and healthy than they otherwise would have been. Such floors also tended to prevent the cracking of the walls, owing to the solidity and firmness imparted to their foundations. We recommend the general adoption of such floors for all buildings which may be hereafter built on made soil, or in damp situations.

DRAINS AND CESSPOOLS.

It is of the utmost importance to the health of cities that the drains which lead from houses to common sewers should have a pretty good descent, so as to keep them free from being choked up, and to allow of a quick discharge of all matters that flow into them. Sewers should never be built so as to end abruptly at the point of discharge, but should be angled, because the wind is liable sometimes to blow through straight drains, and carry fœted gases up into the buildings.

Cesspools (which are deep holes made below the surface of the ground to receive sediment water) are magazines of filth and storehouses of disease. They generate pestiferous vapors, and should never be allowed near dwelling-houses. In cities and villages where no general system of drainage is carried out, it is not uncommon to find a cesspool built alongside of almost every house, and some have cesspools in their cellars. A cesspool, instead of making a house more dry, as is usually supposed, actually tends to render it more damp, by collecting and retaining the water in a large body. We once saw a church which had a large cesspool made alongside of it, under the pavement, the whole water from the roof being conducted into the cesspool. The basement, which constituted the lecture room, was always exceedingly damp and chilly, but, for years, no one seemed to be able to give a good reason for it. At last one person suggested that the water from the roof should be conducted into the street instead of into the cesspool, and the experiment was tried. The result was most favorable; and the lecture room has now become much more dry and comfortable.

HEAT OF DIFFERENT WOODS.—The following is set down as the relative heating values of different kinds of American wood. Shell-bark hickory being taken as the highest standard, 100; pig-nut hickory, 95; white oak, 84; white ash, 77; dog-wood, 75; scrub oak, 73; white hazel, 72; apple tree, 70; red oak, 69; white beech, 65; black walnut, 65; black birch, 62; yellow oak, 60; hard maple, 59; white elm, 58; red cedar, 56; wild cherry, 55; yellow pine, 54; chesnut, 52; yellow poplar, 52; butternut, 51; white birch, 48; white pine, 42. Some woods are softer and lighter than others; the harder and heavier having their fibers more densely packed together. But the same species of wood may vary in density, according to the conditions of its growth. Those woods which grow in forests, or in rich wet grounds, are less consolidated than such as stand in open fields, or grow slowly upon dry, barren soils. There are two stages in the burning of wood; in the first the heat comes chiefly from flame, in the second from red-hot coals. Soft woods are much more active in the first stage than hard, and hard woods more active in the second stage than soft. The soft woods burn with a voluminous flame, and leave but little coal, while the hard woods produce less flame and yield a larger mass of coal.

LAKE STEAMERS AND RAILROADS.—The class of elegant steamers that used to be the pride of Lake Ontario is fast disappearing from its waters. The *Buffalo Republican* states that the amount of steamboat property ruined by railroads is enormous, and that no less than three or four of the finest boats on Lake Ontario have been sent down to the Atlantic coast this spring, never to return.

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DISCOVERIES CONCERNING THE NEBULÆ.

Modern astronomical observations prove that our sun is simply an individual star, forming only a single unit in a cluster or mass of many millions of other similar stars; that this cluster has limited dimensions, has ascertainable length, breadth and thickness, and, in short, forms what may be expressed by a universe of solar systems. Different clusters exhibit their component stars, seen with the same magnifying power more or less distinctly. This may be explained either by difference of distance or by the supposition that they may consist of stare of different magnitudes, and crowded more or less closely together. The appearance of the stars composing some of the clusters is also very gorgeous. The telescope shows that the cluster which surrounds Crucis, in the southern hemisphere, occupies the forty-eight part of a square degree, or about the tenth part of the superficial magnitude of the moon's disk, and consists of about 110 stars from the seventh magnitude downwards, eight of the more conspicuous stars being colored with various tints of red, green and blue, giving to the whole the appearance of a rich piece of jewelry.

Cluster compared with cluster shows all gradations of smallness and closeness of the component stars, until they assume the appearance of patches of starry powder. These varities are obviously ascribable to varying distances. Then follow those patches of starry light which are seen in so many regions of the heavens, and which have been denominated nebulæ, appearing with very different degrees of magnitude and brightness. That these are still clusters of which the component stars are indistinguishable by reason of their remoteness, there are the strongest evidence and most striking analogies to prove. Every augmentation of power and improvement of efficiency the telescope receives, augments the number of nebulæ which are converted by that instrument into clusters. The labors of eminent astronomers, the colossal telescopes constructed, and the erection of observatories in multiplied numbers in climates under skies more favorable to observation, have all tended to augment the number of nebulæ which have been resolved, and it may be expected that this progress will continue.

FISH CHUTES FOR DAMS.

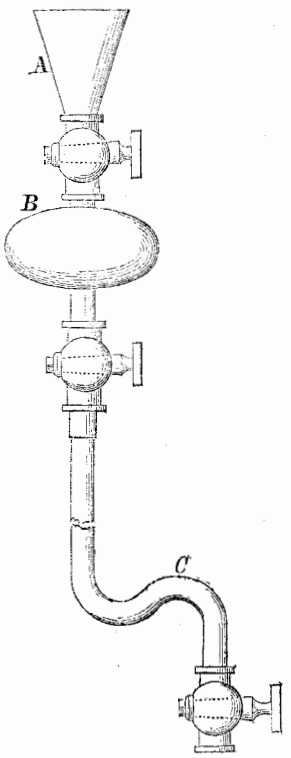
It is well known that "fish of passage," such as salmon and shad, have been prevented from returning to their spawning grounds by dams erected across many of our creeks and rivers, and, as a consequence, they have entirely disappeared from waters in which they were formerly very numerous. To provide a remedy for this evil and allow such fish to return to their old summer haunts, Mr. S. P. Sleppy, of Wilkesbarre, Pa., proposes (in a recent letter to us) that a zig-zag inclined chute, somewhat resembling a gold miner's *ruffle*, should be erected at the side of every dam, by which the fish may be enabled to ascend pretty high falls. Simple inclined chutes have been put up at the sides of dams on several European rivers (laws being passed for this purpose) to accomplish the same objects; but a zig-zag chute is better adapted for all kinds of fish, as only salmon (which have great ascending powers) are capable of moving up a high and steep incline. The proposition of our correspondent impresses us favorably, and we hope to see it acted upon very generally by the owners of dams on our creeks and rivers. If they do not carry out this suggestion voluntarily, we recommend the passage of laws for accomplishing the object. There is a positive obligation resting upon all our State governments to pursue such a policy, because it will benefit many persons and do harm to none. Although the dams of saw-mills and factories are of great benefit to the individuals engaged in the industrial manufacturing arts, they have injured the people in many sections of our country. Thus, the shad used to ascend the Susquehanna river, and the people in the Wyoming Valley (as our correspondent informs us) were then periodically supplied with an abundance of this fine fish. Now, they cannot ascend these waters, owing to the dams which have been erected on this river; and as a result, fresh shad is now unknown to the dwellers in this interesting portion of our country. By erecting zig-zag inclined chutes on these dams no loss of water-power would be sustained, while the fish, we think, would be enabled to ascend by the whirls and occupy their old grounds. The project is at least worthy of a trial; and it is during the summer months, when the waters are low, that these contrivances should be erected.

NOVEL AIR PUMP.

[Translated for the Scientific American.]

The accompanying figure represents a curious air-pump proposed by A. Gairaud, of France, to supersede the common piston air pump. The agent for producing a vacuum in this pump is mercury, acting by gravity; and instead of a flap valve, as in the air pump, air-tight faucets are substituted.

It is conceded by all philosophers that, with the common air pump, the rarification of the air can be carried on only to a certain limit; the best air pump not being able to bring the column of mercury in the barometer attached to it below one-sixteenth of an inch; and it is obvious that the air in the receiver will not be able to raise the valve, on account of its rarity. These defects are proposed to be removed by the mercurial air pump which is the subject of this article. This pump consists of a barometer tube about 33 inches long and 5-16 to 3-8 of an inch in diameter. Its lower end C, is bent in the form of an ∞, and it is closed by a cock. The upper end of the tube is firmly secured to a glass egg-shaped vessel, B, containing from half a pint to one quart, and is provided with a stop-cock below and with another one above; this latter faucet being covered by a funnel, A. The several fastenings and cocks are all made of iron, and the apparatus is screwed on a table.



To set the pump in operation it is filled with mercury through the funnel on the top, and the upper cock is closed. By opening the stop-cock at the lower end of the tube the mercury escapes into a vessel placed underneath, a column of 30 inches remaining in the tube; and a complete vacuum is obtained in the egg-shaped vessel, forming in this case the vacuum of Toricelli.

To apply this apparatus to the Magdeburg hemispheres, the lower one is secured to the top of the tube and a hole is drilled in the upper one, which is stopped up by a cock, so that it can be filled with mercury and closed. By opening the stop-cock at the lower end of the tube a perfect vacuum is attained in the hemispheres.

To exhaust or to rarify the air in a common receiver this apparatus is also superior to the common air pump, as by its aid the rarification can be carried on *ad infinitum*. The receiver is placed on the table and made to communicate with the glass egg-shaped vessel on the top of the tube by means of an iron pipe which is provided with a stop-cock. If the contents of the receiver and of the glass egg-shaped vessel are equal, the density of the air is reduced one-half by each operation, and after repeating the operation ten times, its density is not more than 1-1024, and after twenty times it is not more than 1-1048576 of its original density. In this case, however, it is desirable to place the receiver on a ring or dish of india-rubber instead of closing the joint by means of tallow.

This apparatus is much cheaper than any of the common air pumps; and by the aid of 20 or 25 lbs. of mercury all the usual experiments can be performed. It would be still less expensive if made of gutta-percha. If the tube is long and large enough, water may be used instead of mercury, and the apparatus may be employed for exhausting the air wherever it is desirable to make use of the atmospheric pressure, or in order to boil certain substances in a partial vacuum.—*Dingler's Polytechnic Journal.*

MECHANICAL HORSE-TAMER.

With a philosophical indifference to the lofty teachings in horse-taming as practiced by Professor Rarey (with whose feats the whole world resounded in 1858), J. G. Bunting, of London, has taken out a patent for what he calls a "Mechanical Horse-tamer." It consists of a post driven into the ground and having at its upper end a stout pin, to which are secured two horizontal poles. Upon the outer ends of these are attached axle-arms to carry heavy cart wheels and they are arranged to form a sort of cradle in which the horse to be tamed is fastened by suitable straps. He is unable to plunge by the weight of the wheels, or to lie down on account of the under straps, and he is prevented from running backward by a prop which is fixed to the hind pole. In this contrivance the unruly animal is coerced into obedience; but as to the extent of his training, or how long it takes to *break him in*, we are not informed.

THE MAELSTROM NOT A MYTH.—The ancient accounts of the above-named whirlpool on the coast of Norway were imposing for the terror which were ascribed to it. It was stated to be several miles in extent—a large boiling cauldron circling round in one great eddy, into which whales and ships were sometimes drawn and carried down forever beneath its horrid waters. That such a whirlpool does exist would appear to be true, but it is not such a terrific affair after all. M. Hagerup, the Minister of Norwegian Marine, has recently given some account of it. He states, that the great whirl is caused by the setting in and out of the tides between Lofoden and Mosken, and is most violent half-way between ebb and flood tide. At flood and ebb tide it disappears for about half an hour, but begins again with the moving of the waters. Large vessels may pass over it safely in serene weather, but in a storm it is perilous to the largest craft. Small boats are not safe near it at the time of its strongest action in any weather. The whirls in the Maelstrom do not, as was once supposed, draw vessels under the water, but by their violence they fill them with water or dash them upon the neigboring shoals.

A GREAT TEMPERANCE MOVEMENT.—On the morning of the Fourth of July we saw a number of men employed in tapping the hydrants in Broadway, from the Battery to Fourteenth-street (about three miles), and attaching a tin cup by a chain, so that the multitudes who crowded to see the military procession might slake their thirst with pure Croton water, instead of being forced into grog-shops and bar-rooms to obtain a cooling beverage of doubtful liquor. This might well be done to all the hydrants, and if water-fountains were well distributed in the more depraved parts of our city much crime and debauchery would cease. The Fourth of July movement was the inaugeration of a great temperance reform, one likely to be of more practical value than forming temperance societies. Pure water, pure air, and whitewash are wonderful reformers, and we wish that the value of the three was more highly estimated by our city authorities than they are.

NEW MODE OF RIPENING PEARS.—In Hovey's *Magazine* it is stated that, at a late meeting of the English Horticultural Society, H. O. Carre, of Guernsey, communicated the results of some experiments he had made with regard to improving the flavor of various kinds of pears by heat and light under glass. Last autumn he placed on a broad shelf in the warmest part of a greenhouse, near the glass at the top, various kinds of pears, as soon as they were gathered from the trees out-of-doors; and likewise some near the front sashes; the fruit was thus exposed to heat and sunlight, and the improvement in flavor, as regards some varieties, was most remarkable. He intends to prosecute his experiments; and from his success last season, he is led to believe that in many parts of England, where pears do not ripen well, they may be rendered much more melting and sugary by adopting the plan of exposing them to light and heat, when gathered, than if kept in the ordinary way.

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ATMOSPHERIC ELECTRICITY AS A MOTOR.

MESSRS. EDITORS:—In "No. 1, Vol. I., New Series," of the SCIENTIFIC AMERICAN, there appears an article under the head of "Lightning Batteries—Remarkable Invention." Under that head you say that M. Hippolite Charles Vion, of Paris, France, has invented and patented certain contrivances for bringing down, from the atmosphere, natural electricity, to be used as a power for various purposes, and that in level countries it is to be brought down with a balloon and conducting wire. As I claim at least priority of design, if not of doing the thing satisfactorily (although I have brought down electricity profusely with a six-feet diameter balloon without a metallic conductor), permit me to say how far my claim stands the proof of record.

In the summer or Fall of 1857 I wrote to Professor Joseph Henry, the Secretary of the Smithsonian Institution, about it, and my wish of having it tried with a large balloon to go a mile or two up with metallic tractors and conducting wire. On September 26, 1857, Professor Henry answered me (in part) thus:—"It is a fact, established by abundant experiment and observation, that the difference of electrical intensity between the surface of the earth and the atmosphere increases as we ascend in the latter. If we were to suspend a copper wire to a balloon, the lower end of which is insulated at the surface of the earth, the quantity and intensity of the electricity which would be given off from the lower extremity would increase with the elevation of the balloon, though the law of the increase with the elevation is not yet known. I doubt whether a sufficient quantity of electricity, for practical purposes, could be obtained in the way you propose. The electricity of the atmosphere, though greater in intensity, is very small in quantity, according to the experiments of Faraday, Pouillet and others. I would not wish, however, to discourage your experiments. It would give me much pleasure to see you in Washington, and to have a long talk on the subject of atmospheric phenomena," &c.

In April, 1858, I made my visit to Washington accordingly, having now got privilege of a personal conversation with a philosopher in whom I had more confidence as to solid truths yet undeveloped than any man living. I passed over a day with Professor Henry, and after stating to him all I knew about storms and atmospheric phenomena, so far as I understood it and saw and experienced it, I made the proposition of building a balloon expressly for the electrical experiment, provided the Smithsonian Institution would furnish the gas, wire, rope and other instruments, and direct the experiment; and to this Professor Henry at once agreed. This balloon was built last summer, and we had arranged for the experiment in August or September of 1858; but business pressing upon Professor Henry in bringing out his "Report," and other matters, we deferred the thing for this summer. The balloon is still on hand, and is labeled "*Smithsonian.—Pro Scientia et Arte.*" I made an ascension in that balloon on the 14th ult., and noted some remarkable atmospheric phenomena, which were at once submitted to Professor Henry. In the acknowledgement of my report, Professor Henry says:—"I shall probably have a few weeks' vacation this summer, and would be pleased to make some of the experiments with you which we contemplated last summer. Please inform me when it would be most convenient for you to meet me." When I received this cheering news from Professor Henry, of readiness to try this experiment, I was busily engaged in getting things ready for the great trans-continental trip from St. Louis to the Atlantic seaboard in the balloon *Atlantic*, furnished by Mr. O. H. Gager, of Boston, and with whom I had entered into a contract for the directorship of that enterprize. Since that time I have written to Professor Henry, and am awaiting his orders to proceed to Washington with the balloon *Smithsonian*, to put the matter under trial.

If Mr. Hippolite Charles Vion has already made this thing practically demonstrable, *i. e.*, using it for the purposes designated, then I am too late for the uses of the patent. If, like myself, he only *thinks* it will subserve these purposes, then I claim priority for my own country. It often happens that two or more persons are pursuing the same investigations without knowing of each other's efforts, and this is certainly the case with me so far as the French experiment is concerned. I have, for five years' past, corresponded with electricians in this country on the subject and on the resources of atmospheric electricity; but until the time above mentioned, I did not take the necesary active steps to bring it under test. I wanted a person to direct the experiments, and Professor Henry was the man I preferred above all others to be my guide and director in them. I proposed to him that this electricity could be brought down as *a great motor for all mechanical purposes*, that it would serve us much better than steam or water power, and at a comparative trifling cost. Irrespective of this, however, an electric-collecting balloon, suspended a mile or two above a city, would be a sure defense against electrical destruction or damage to that city.

JOHN WISE.

Lancaster, July, 1859.

[In addition to the above communication on this subject from Mr. Wise, we have received another from C. Kirchoff, of this city, in which he makes similar claims. He made the discovery a long time ago, and says he has tested it in the presence of witnesses. He also states that not only atmospheric, but *all* electrical currents, of whatever kind and character, may be stored up and afterwards used at pleasure, and be conveyed on a conductor to any distance. He has made many experiments of this character, and has had the apparatus in operation for several days without interruption. With such currents he once kept two telegraphs that he had on exhibition at the N. Y. Crystal Palace (in 1857) in continuous operation for more than an hour. The power which he thus obtained from the free storehouse of nature was equal to a Grove's battery of six cups. From the documents or M. Vion, however, we judge that he has given this subject attention for a number of years, and that he reduced his ideas to practice long ago.—EDS.

PLATING ON IRON.

MESSRS. EDITORS:—In my last receipts published on page 142, Vol. XII., of the SCIENTIFIC AMERICAN, was one for plating direct on iron, which would only stand dressing but not burnishing. I have since then succeeded in plating direct on iron, cast (grey), malleable, or wrought, and steel, so that it will stand the heaviest burnishing, rolling, or being brought to a blueing heat, without striping, by the following process:—The iron or steel to be plated must be previously pickled in clear muriatic acid, then rinsed in clean cold water, and plated for about 10 seconds (with a battery of at least three pairs) in the following solution: Dissolve 80 grains or chloride of silver in 32 ounces of cyanide of potassium, one ounce of chloride of potassium and one gallon of rain or distilled water. After receiving the first coating in this solution it is to be finished in the ordinary solution for plating brass, &c. I have plated a number of sewing machines, table knives, &c., without once failing.

Very respectfully,

RICHARD WOOD.

Newark, N. J., July 11, 1859.

THE PLEASURES OF KNOWLEDGE.

"How charming is divine philosophy!
Not harsh and crabbed, as dull fools suppose,
But musical as is Apollo's lute,
And a perpetual feast of nectared sweets,
Where no crude surfeit reigns."

So sung Milton two centuries ago, and long before that date Plato had announced that "the world is God's epistle to mankind." It is the grand book in which all may read, and whose pages are so full of varied interest and genial knowledge that the being who, having the power, neglects to study it, surely may be written down an ass, for he deprives himself of an enjoyment such as no other pursuit can give.

We are sometimes inclined to be vexed with our race when we find them all toiling after every vain fancy, some bent upon one ambition, some another, and but a minority digging in the deep mine of nature for the grandest of all possessions—Truth. Granted that its gold is not yellow, nor its silver white, for its treasures have not the color of material wealth, but they are as glorious and beauteous as the sparkle of the diamond and as enduring as the hills. Science clothes not her votaries in purple and fine linen, but dresses them in lovely flowers or in iridescent shells, and gives as her reward a contented mind and a pure soul. The poetry of science sometimes flashes in the oration of a professor or in the pages of a book, but her truest epic is written upon all materiality, which proclaims that in all things there is a law which, when known and applied, shall make man happier, better and more truly human.

By the investigation of the laws which govern the objects that are all around us, the motions of the planets, the relations of life and health, the destiny of man, and the glory of the Deity, are better understood; and the lighting of a cottage, the building of a palace, or the cooking of a dinner are better performed. We can never be in any position in which knowledge is not of value to us, and we can never prophecy the moment at which we may most require it. Indeed many of us only know that there is more to be known than occurs to us in the daily round of business life, by the discovery that something we do not know is calculated to make us richer or give us more ease. "But," exclaims many a petulant person, "how shall I study without an instructor, or how investigate without apparatus?" Foolish notions! the best workman always uses the simplest tools. Have you eyes, ears, nose and hands? Then you are provided with apparatus, and memory is the tablet on which to write down your impressions. Each one of us is better furnished than a college laboratory or a professor's lecture room, and all that we have to do is to learn the use of our apparatus; and there is no place in the universe where man cannot find some object to interest, some study to pursue. Goldsmith found time to observe nature and record his thoughts, and in glowing language he tells us that "the blushing beauties of the rose, the modest blue of the violet, are not in the flowers themselves, but in the light which adorns them. Odor, softness, and beauty of figures are their own, but it is light alone that dresses them up in their robes, which shame the monarch's glory." As a concluding incentive to our readers to study for themselves, as well as to read books and scientific periodicals, we will give a quotation from a lecture by Prince Albert of England. "Man," observes this eminent *savant*, "is approaching a more complete fulfillment of that great and sacred mission which he has to perform in the world. His reason being created after the image of God, he has to use it to discover the laws by which the Almighty governs his creation, and, by making these laws his standard of action, to conquer nature to his use—himself being a divine instrument. Science discovers these laws of power, motion, and transformation; industry applies them to the raw material which the earth yields us in abundance, but which becomes valuable only by knowledge."

Oh! that all would study nature more and think of themselves a little less; then we should indeed be a people of kings, whose empire would be the world and whose subjects would be all created things!

DIAMONDS IN THE ARTS.

It is not only for the purposes of ornament that diamonds are employed, they are most useful for some purposes in the manufacturing arts. Discolored diamonds are reduced to powder, and there are many operations for which they are indispensible. Fine cameos and some precious stones are engraved with the diamond. It is employed for cutting the glass for windows. The point used for this purpose is of a trapezoidal shape, weighs about the sixtieth part of a carat, and is usually set in a wooden handle. The edge is a natural one, and could not be given to it by art. From the high refractive power of the diamond, it is sometimes employed to form minute and exquisitely accurate lenses for the best kind of microscopes. In respect to the general operations of the lapidary or jewel-cutter, they could hardly be conducted without the aid of diamond-dust; for the usual mode of cutting and shaping precious stones is to hold them against a very small metallic disk or wheel, which is rotating with great velocity, and to moisten the edge of this disk with oil and diamond-dust. The exceedingly hard particles of diamond-dust enable the disk to cut the stone or jewel. The rays of light easily pass through other gems, but in the diamond they are refracted to the surface, and this refraction occasions its superior brilliancy.

OUR SEABOARD.—The line of coast belonging to the United States is very extensive. According to the report of the Coast Survey, there are 6,821 miles of Atlantic coast, 3,467 miles of the Gulf coast, and 2,281 miles on the Pacific, making a total of 12,569 miles. The main shore line of the Atlantic, including bays, &c., is twice the extent of the Gulf, three times that of the Pacific, and more than equal to that of the Pacific and Gulf combined. The southern States have three times as much sea-coast as the northern

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ALUMINUM-BRONZE FOR AXLE BOXES.

A letter was recently read before the Academy of Sciences, Paris, from M. Christofle, detailing his experience with a bronze alloy compound of 90 or 95 parts of copper and from 10 to 15 of aluminum. The following is the substance of the letter referred to:—

"We have applied the aluminum-bronze to two uses for which its qualities of hardness and tenacity appear usefully applicable, and success has answered our attempt. The first is the manufacture in this bronze of axle-bearings, and rubbing surfaces for machines. We give as examples:—First, an axle-box which was placed on a polishing lathe making 2,200 turns per minute; it lasted for nearly eighteen months; other boxes in the same condition do not last over three months. Second, a carriage for a circular saw, making 240 tons per minute, which has lasted for a year without an apparent trace of wear; the carriages in common bronze do not last more than four months. The other application is the employment of this bronze in the manufacture of guns of all kinds. We made a pistol-barrel which, after having been tried at Paris, was afterwards tried at the exhibition at Dijon. It underwent the tests in presence of the jury, and answered perfectly our expectations. We are aware that these experiments cannot be conclusive as to its application for artillery; but the comparative experiments which we have made made with this metal, bronze, iron, and steel, have shown its immense superiority over those different metals. The bars may be worked hot as easily as the best quality of steel."

[Some of our friends have recently been making experiments with aluminum alloys, and have found it very difficult to make them. Thus far, we may say that their experiments have been unsuccessful, owing to the difficulty of the aluminum amalgamating with copper, silver and iron. Some of our readers may have been pursuing the same line of investigation, and those of them (if any) who have been successful, would confer a benefit upon the public by giving us the results of their experiments.—EDS.

COAL FORMATIONS OF NORTH AMERICA.

In an article on this subject, in the last number of *Silliman's Journal*, L. Lesquereux, lays down the theory of the formation of coal-beds as follows:—"The theory of the formation of the coal by the heaping of consecutive layers of plants and trees grown in the place, preserved in water and buried afterwards (or the peat-bog theory as it is called by some) is then the only one admitted now as satisfactorily explaining the process of the coal. The analogy of formation between the peat-bogs of our time and the beds of coal of the old measures cannot be called a theory; it is a demonstrable fact. We can now see the coal growing up by the heaping of woody matter in the bog. After a while we see it transformed into a dark combustible compound, that we name peat or lignite, according to its age. We then see it hardening either by compression, or by the slow burning in water that has been so well explained by the experiments of Liebig. Most of the peat-bogs of Europe, at least the oldest, have at or near their bottom some plates or thin layers of hard, black matter, that ocular examination or chemical analysis fail to distinguish from true coal. We also find in Holland, Denmark and Sweden, thick deposits of peat separated into distinct beds of strata of mud and sand, giving the best possible elucidation of the process of stratification of the coal measures.

It is not only in their general features that both formations are so much alike. But in the minutest accidents and even local peculiarities, their agreement is clear and unquestionable to one who has studied the formations of the peat-bogs of our time."

THE SWING AS A CURE FOR CONSUMPTION.

Dr. L. Long, of Holyoke, in a letter to the *Springfield Republican*, recommends the gymnastic swing as a preventive and cure of pulmonary disease. He says:—"I the suspending of the body by the hands, by means means of a strong rope or chain, fastened to a beam at one end, and at the other a stick three feet long, convenient to grasp with the hands. The rope should be fastened to the center of the stick, which should hang six or eight inches above the head. Let a person grasp this stick, with the hands two or three feet apart, and swing very moderately, at first—perhaps only bear the weight, if very weak, and gradually increase as the muscles gain strength from the exercise, until it may be freely used from three to five times daily. The connection of the arms with the body (with the exception of the clavicle with the sternum or breast-bone) being a muscular attachment to the ribs, the effect of this exercise is to elevate the ribs and enlarge the chest; and as nature allows no vacuum, the lungs expand to fill the cavity, increasing the volume of air—the natural purifier of blood, and preventing congestion or the deposit of tuberculous matter. I have prescribed the above for all cases of hemorrhage of the lungs and threatened consumption, for 35 years, and have been able to increase the measure of the chest from two to four inches within a few months, and always with good results. But, especially, as a preventive, I would recommend this exercise."

TO MAKE BUTTER IN FIVE MINUTES WITHOUT A CHURN!

A correspondent highly recommends the following recipe:—After straining the milk, set it away for about twelve hours, for the cream to "rise." (Milk-dishes ought to have good strong handles to lift them by.) After standing as above, set the milk, without disturbing it on the stove; let it remain there until you observe the coating of cream on the surface assume a wrinkled appearance, but be careful it does not boil, as should this be the case the cream will mix with the milk and cannot again be collected. Now set it away till quite cold and then skim off the cream, mixed with as little milk as possible. When sufficient cream is collected proceed to make it into butter as follows:—Take a wooden bowl, or any suitable vessel, and having first scalded and then rinsed it with cold spring water, place the cream in it. Now let the operator hold his hand in water as hot as can be borne for a few seconds, then plunge it in cold water for about a minute, and at once commence to agitate the cream by a gentle circular motion. In five minutes, or less, the butter will have come, when, of course, it must be washed and salted according to taste; and our correspondent guarantees that no better butter can be made by the best churn ever invented.

To those who keep only one cow, this method of making butter will be found really valuable; while quite as large a quantity of butter is obtained as by the common mode, the skim-milk is much sweeter and palatable. In the summer season it will usually be found necessary to bring the cream out of the cellar (say a quarter of an hour before churning) to take the excessive chill off; in winter place the vessel containing the cream over another containing water to warm it; then continue to agitate the cream until the chill has departed.

Before washing the butter, separate all the milk you possibly can, as the latter will be found excellent for tea-cakes. Butter made in this manner will be much firmer, and less oily in hot weather than when made in the ordinary way.

PRESERVING EGGS.—The following recipe is from a recent work on "Game Fowls," by Cooper & Vernon, of Media, Pa.:—"Disolve some gum shellac in a sufficient quantity of alcohol to make a thin varnish, give each egg a coat, and after they have become thoroughly dry pack them in bran or saw-dust, with their points downwards in such a manner that they cannot shift about. After you have kept them as long as you desire, wash the varnish carefully off, and they will be in the same state as they were before packing, ready either for eating or hatching." The author of this work states that he has been engaged for thirty years in raising the best of game fowls, and he has freqently imported eggs from Europe which he directed to be packed according to this recipe, and from such eggs he has raised chickens. This is certainly a very simple mode of preserving eggs and very superior to the common method of laying them down in milk of lime.

TO MAKE CREAM CHEESE.—Take a quart of cream, or, if not desired very rich, add thereto one pint of new milk; warm it in hot water till it is about the heat of milk from the cow; add a small quantity of rennet (a table-spoonful is sufficient); let it stand till thick, then break it slightly with a spoon, and place it in a frame in, which you have previously put a fine canvas-cloth; press it slightly with a weight; let it stand a few hours, then put a finer cloth in the frame; a little powdered salt may be put over the cloth. It will be ready for use in a day or two.

QUESTIONS ABOUT HEAT.

MESSRS. EDITORS:—Is there any heat lost by the expansion of steam in the cylinder of an engine, besides that which is conducted or radiated away by the iron? Is not flame the result of a combination of elements that constitute heat *after* the combination has taken place; and, consequently, are not the products of combustion invisible and hotter than the flame itself?

Greenbush, N. Y., July, 1859. J. H. P.

[In the abstract, heat is never lost. But, independent of radiation, it has been ascertained that condensation of steam always takes place in a cylinder according to the amount of expansion, and thus the working heat is converted to inactivity, and is thus actually lost for mechanical purposes. Flame is the result of a combination of elements, and heat is produced while this combination takes place. The nature of heat is not known, and it is explained in different ways by different philosophers. The products of the flame are invisible, and they are colder than the flame, which latter is the seat of the heat, and serves to heat the invisible products.

SUMMER SOURS.

Physiological research has fully established the fact that acids promote the separation of the bile from the blood, which is then passed from the system, thus preventing fevers, the prevailing diseases of summer. All fevers are "bilious," that is, the bile is in the blood. Whatever is antagonistic to fever is "cooling." It is a common saying that fruits are "cooling," and also berries of every description; it is because the acidity which they contain aids in separating the bile from the blood, that is, aids in purifying the blood. Hence the great yearning for greens and lettuce, and salads in the early spring, these being eaten with vinegar; hence also the taste for something sour, for lemonades, on an attack of ever. But this being the case, it is easy to see, that we nullify the good effects of fruits and berries in proportion as we eat them with sugar, or even sweet milk, or cream. If we eat them in their natural state, fresh, ripe, perfect, it is almost impossible to eat too many, to eat enough to hurt us, especially if we eat them alone, not taking any liquid with them whatever. Hence also is buttermilk or even common sour milk promotive of health in summer time. Sweet milk tends to biliousness in sedentary people, sour milk is antagonistic. The Greeks and Turks are passionately fond of sour milk. The shepherds use rennet, and the milk-dealers alum to make it sour the sooner. Buttermilk acts like watermelons on the system.—*Hall's Journal of Health.*

FOOD FOR HORSES.—The *Working Farmer* says:—Carrots have a value far beyond that which can be attributed to the mere nutriment they contain, for in addition to what they furnish in this way, they contain a quantity of pectic acid, and this carries the property of gelatinizing the vegetable and animal matters held in solution, and thus enabling the the peristaltic motion of the intestines to sieze hold of their contents, so that digestion of all matters of food is perfected by the presence of carrots. It is for this reason that a bushel o. carrots and a bushel of oats, are better for the horse than two bushel of oats; not from the nutritious matter contained in the carrot, but in part from the power of the carrot to cause all the nutriment of the oats to be appropriated in the making of muscle, instead of part of it being evacuated in excrement. This action is true in regard to all the vegetable substances which go to make up the variety of food for animals, and the very instinct of every animal gives evidence of this truth.

SUPERPHOSPHATE OF LIME FOR TREES.—Phosphoric acid has a mysterious influence on the develoment of roots, causing plants to throw them out vigorously. The most convenient way of employing this substance is in the form of superphosphate of lime—that is, a mixture of oil of vitriol and burnt bones. This compound, rich in the acid in a soluble state, mixed with a little dry mold, will be found a fertiliser of great use in transplantng trees. But it must be used in moderation, for plants, like animals, may be injured as much by overfeeding as by starvation.

AMERICAN COPPER.—There were smelted at the Cleveland (Ohio) Works, last year, 1,127 tuns of crude copper and 871 tuns of fine, besides some thousands of barrels of stamp and crude masses.

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BALLOONS IN WARFARE.

In the early part of the famous French Revolution, science and art were marshaled into the service of the republic, and the Academy of Sciences recommended the use of balloons for reconnoitering the positions of the enemy's forces; and for this purpose an aeronautic school was established near Paris. This was done with great secrecy so that the French could alone avail themselves of such advantages. The management of this institution was committed to eminent philosophers, and 50 military students were admitted into it for special training. A practicing balloon, containing 17,000 feet of hydrogen gas, was kept constantly full and ready for exercise; and whenever the weather permitted, the colonel of the *corps* and a pupil seated themselves in the car and were elevated to any height desired, the balloon being confined to the earth by a cord attached to the car, and operated by a windlass. So successful were these school-experiments that balloons were made for every division of the French army. Just before the battle of Fleuris, in June, 1794, M. Contet ascended in his war-balloon with an adjutant and a general, to reconnoiter the hostile Austrian army. They rose to a height of several thousand feet, with their rope and windlass machinery to make it stationary, and took observations for several hours. The reconnoisance thus made enabled the French general (Jourdan) to dispose his forces in such a manner that he gained a speedy and decisive victory.

Sixty-five years have passed away since that event took place, and in the same month (June) the French now find themselves once more before the same foes ready to engage in the same deadly struggle; and it is a remarkable coincidence that the same means of reconnoitering are again employed by the same people. On the 24th of June, the great battle of Solferino was fought in Italy, between the French and Austrians, in which the latter were defeated, and the former suffered so severely that their army could not follow the retreating enemy. The brothers Goddard, of Paris, whose fame as aeronauts is very high, were on the ground with their balloon; and one of them made an ascent on the day preceeding the struggle, to explore the Austrian positions. He rose about 3,500 feet, made some observations then descended, having apparently perfect control over his balloon. It is not stated how this affected the result of the battle; it did not, at least, lead to any disposition of the French army for attacking the Austrians, as the latter were the attacking party. But the Austrians may have thought that these balloon observations, by giving the French a key to the positions of the enemy, placed them (the Austrians) at a disadvantage, and their best policy was to change their entire arrangement, by taking the initiative. It is stated that Messrs. Goddard are to accompany the army, and this affords some data for concluding that ballooning is to be further employed in this war. Whether (as has been proposed by some authority) cannon and shot may be carried up in balloons, and discharged down upon an enemy remains to be seen, as such experiments have not yet been made.

In connection with this subject we may state that, in fulfillment of the intention expressed in our last issue, we succeeded in procuring an illustration of the great balloon, *Atlantic*, in which Mr. Wise and his three courageous associates were conveyed from St. Louis, Missouri, to Jefferson county, New York; but on inspecting it, we found it to be only an ordinary balloon, quite destitute of any feature of novelty that would interest our readers, and hence we resolved to exclude it from our columns and substitute the above letter-press upon a kindred topic, which will doubtless be much more attractive to the greater portion of the reading public, especially to the friends of Italy, American aeronauts, and military men of all nations.

WHY A SHIP IS "SHE."—Some heartless wretch (who should be punished by being tied to a post with his face within six inches of kissing distance of a pair of bewitching "cheery lips"—feminine lips—with the certainty of never reducing that number of inches between him and bliss) says "a ship is called *she* because a man knows not the expense till he gets one—because they are useless without employment—because they look best when well rigged—because their value depends upon their age—because they bring news from abroad, and carry out news from home."

LANDRY'S RAILROAD CHAIR.

The chair which forms the subject of our engravings is used on the Troy and Boston and the Rensselaer and Saratoga railroads, on each of which it gives great satisfaction.

Fig. 1 is a perspective view of the chair and joint, and Fig. 2 is a section showing the chair, rail and car-wheel. A is a projecting piece of metal which is cast on the chair and hardened, or it may be made of wrought iron or steel and secured to the chair or to the rails themselves. B is the support to the rail for lateral pressure, and C the seat of the rail. The rail is wedged up tight by spikes, G G, that are driven through the chair into the cross-tie. E is the inside of A, which is kept as close to the rail as possible, but so as not to prevent the wedging up. H are the holes in the chair to admit of its being spiked to the cross-tie. J J are the ends of two rails, which ought to be laid as close together as possible;

Fig. 1

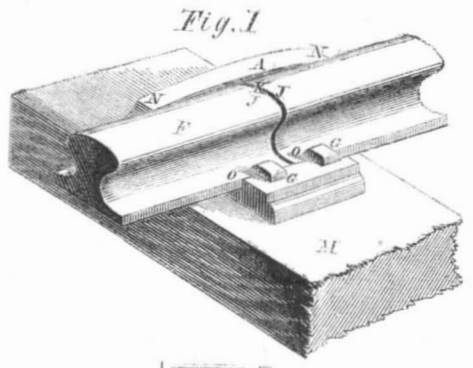
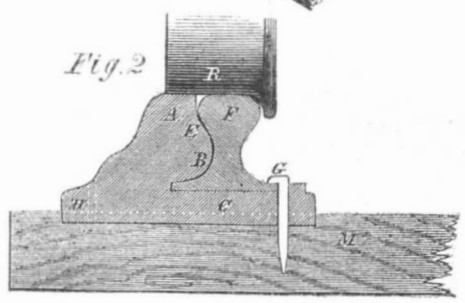


Fig. 2



but when laid in cold weather, a space, K, should be left between them. The projecting piece, A, is level with the rail at its two extremities, N N, but rises a little higher in the center and so relieves the ends of the rails from pressure, causing them to wear considerably longer. Small oblong jams, O O, are made in the rail to admit of the spikes, G G. R is the wheel passing over the rail, F. By the use of this chair a bearing will be afforded to the cones of the wheels of locomotives and cars, thereby preventing the unpleasant jarring of the machinery and the undue wearing of that particular part of the rails. These chairs can be made of any required size and strength, taking as much bearing from the ends of the rails as the maker may determine, and they can be applied to any rails.

The inventor is H. A. Landry, of Camden, N. J., and the patent is dated Jan. 18, 1859. The invention has been assigned to F. G. Ransford, of Troy, N. Y., who will be happy to furnish any further information upon being addressed.

DEATH OF RUFUS CHOATE.

This distinguished man departed this life at Halifax, N. S., on the 12th inst. About a month previous to this event he had sailed for Europe, from Boston, in search of health, but was so feeble that he proceeded no further than Halifax, where he remained until death closed his eyes. Rufus Choate was born at Ipswich, Mass., in October, 1799. He distinguished himself for ability while a student at Dartmouth College; and having chosen law as his profession, he studied at both Cambridge and Salem, and commenced business at Danvers in 1824. He soon began to take an active part in politics, early became distinguished for his eloquence and power of argument, and was elected to the State Senate in 1838, when only 29 years of age. He also filled the position of United States Senator for four years from 1841 to 1845, and then retired from politics and devoted himself exclusively to his profession. Since the death of Daniel Webster, he was undoubtedly the ablest lawyer and statesman in Massachusetts.

NEW INVENTIONS.

A BUGGY BOAT.—For the convenience of travel, to enable a person to perform a long journey over a diversified tract of country, where rivers and lakes would be apt to impede his progress in an ordinary vehicle, or for many pleasure excursions, a carriage which could be changed into a boat would be very convenient; and such an invention has been patented this week by Perry Davis, of Providence, R. I., the proprietor of the well known "pain-killer." He mounts a common row or pleasure boat upon three wheels, the spokes of the two rear ones being so formed that they can become suitable paddles, so that when they, by cranks and belts, are operated from the inside of the boat, they propel it through the water, and serve the double purpose of paddle-wheels and ordinary carriage wheels.

DITCHING AND DREDGING MACHINE.—Anton Menge, of Point a la Hache, Parish of Plaquemine, La., has invented and patented, this week, a new machine for digging ditches and canals, and also for dredging them. The principal features of the invention are in the arranging of the bucket or cutter-frame in an inclined position in front of the boat, and constructing it so that it can be readily slewed from right to left of the boat by proper machinery. The bucket is also of improved construction, as it acts as a cutter, and has a hinged bottom in order to open and allow the earth or mud to fall at the proper place of discharge; and in connection with this peculiar bucket are arranged revolving cutters, which are situated on the extreme end of the swinging frame, and are made to operate so as to cut and loosen the earth on each side of the buckets while they are digging or excavating, and conveying it to a barge or any suitable place to be discharged.

ARTIFICIAL STONE.—In the list of claims will be found a patent issued to J. L. G. Ward, of Adrian, Mich., for an artificial stone, which is a compound of a solution of silicate of soda, pulverized fluor-spar, pulverized pumice-stone, and Roman cement, which, when properly compounded, forms an excellent protection for the interior or exterior of buildings against the weather or fire, and it can be molded or cast into suitable forms for architectural purposes, or taking casts of sculpture, or other uses. The composition hardens quickly by exposure to the atmosphere, and, when hard, has the most indestructible character, resisting effectually the severest weather, and being only with great difficulty injured by the action of instruments of metal.

PAPER BAG MACHINERY.—This invention consists, firstly, in making the cutter which cuts the paper from the roll or piece, of a peculiar irregular form, whereby it is caused, by the operation by which it cuts the paper from the roll or piece, to give it the form which permits it, without further cutting out, to be folded into a bag. It also consists in the attachment of the "former" round which the paper is folded to form the bags, to the cutter which cuts it from the roll or piece. It also consists in a certain mode of applying and arranging a paster, in combination with the "former" attached to the cutter, for the purpose of pasting the lap which closes the bottom of the bag. It also consists in a certain construction of two side lappers operating in combination with the former to fold the bag, whereby the bottom lap is partly folded by the act of folding the side laps. It also consists in a contrivance applied and operating to start the folded or partly-folded bag from the "former." It also consists in a pair of rollers arranged in a vibrating frame and operating so as to remove the bag from the "former," close the laps and discharge the bag from the machine. It is the invention of William Goodale, of Clinton, Mass.

BIG SAWING.—The Alton (Ill.) *Democrat*, of the 7th inst., describes a feat of sawing which deserves more than a mere passing notice. On the day previous to that date, the editor visited the saw-mill of T. Hamilton, on Wood river, the machinery of which was made by Johnson & Emerson, of the Piazza Foundry, Alton; and between the hours of 5 A. M. and 7 P. M., 100 logs of oak, elm and hickory were sawed, the amount cut being 31,200 feet. This was cut by one circular saw of 58 inches diameter; the time occupied was 14 hours, giving an average of 2,228 feet cut per hour.

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AGRICULTURAL CHEMISTRY.

That such a general knowledge of chemistry as most educated persons possess may be useful to the practical farmer none will deny, but that farmers can or ought to attempt to become scientific chemists, or that they can apply any purely chemical knowledge to the business of husbandry, are propositions few reasonable persons will affirm. At one time the most extravagant expectations were entertained of the benefits chemical discoveries would confer to agriculture, and farmers were frequently and solemnly enjoined to become chemical experimentalists.

Nobody deals more sensibly with the subject of agricultural chemistry than Dr. Voelcker, of the Cirencester College, and in his lecture on "its relation to the cultivation of root crops," delivered before the Royal Agricultural Society, we find its limits very justly defined. He believes that among the landed proprietors, their agents and the larger farmers, especially the rising generation, a more extensive knowledge of the sciences applicable to agriculture is needed. All these want better instruction. But to teach the small farmer or the laborer chemistry is simply absurd. To either, the pursuit would be waste of time. So chemistry should never be made the direct guide to the agriculturist. cience is, after all, only the systematic arrangement of well authenticated facts, and the rising generation should be taught its general principles. But many professors of chemistry have over-estimated their own powers, and *instead of explaining the experience of practial men*, they set themselves up as guides to the farmers; they have overestimated the powers of the new science, and in consequence stumbled.

The foregoing remarks are very just. Again he says: "Agricultural chemistry in its application to farming is altogether a new science; and hitherto it has been, like every new knowledge, too vague and too general in its doctrines as well as in its researches. What is required at the present time are experiments made for a special purpose, researches carried on in the field as well as in the laboratory. We have no need of the joint labors of practical men and men-of-science. There are questions which can only be properly investigated if the man of science heartly joins with the practical man, working cheerfully together, each in his own department, —a nearer approach between agriculture and science, in short, is what is required at the present time. A general knowledge of the principles of farming, however useful to the practical farmer, never will help him to grow a large crop of turnips; he must have special training in practical matters in order to be a successful farmer. So it is with chemical knowledge. Men may have excellent general chemical knowledge, but if they have not special chemical knowledge in relation to farming, their labors will be of little direct utility to the agriculturist."

In reference to the culture of root crops, he says that generally ammoniacal manures, such as guano, are thrown away on roots; and phosphates are more profitable. Guano and superphosphate of lime both rather retard the germination of the seeds, but they push forward the young plant in its early growth. This we believe to form the true value of such manures, though perhaps this is over-estimated.—*London Economist.*

WHAT IS THE JONVAL TURBINE?

MESSRS. EDITORS:—Here is a mooted point; will you please settle it? I think the Jonval is the only turbine set above the waste-water in the race, and that that is its distinctive feature. Of course it can be set at any point of the fall, up to, say, 28 feet; but is any other turbine so set? And as a gentleman gives me a cut of his wheel immersed in the tail-race, the presumption with me is, that it is no Jonval. Am I right?

Very respectfully,

JOHN GILL.

Patriot, Ind., July, 1859.

[The Jonval turbine consists, as we understand it, in conveying the water to the wheel through a stationary wheel set above it, and having water-channels set different but corresponding in number to the buckets of the wheel. The employment of air-tight draft-boxes for water-wheels, to set them at any point up to 28 feet in hight, is the invention of our countryman, Z. Parker, and for which he secured a patent about twenty years ago.—EDS.

UNIFORM MUSICAL PITCH.

A question of considerable importance to all persons interested in musical art was lately brought before the Society of Arts, London, viz., the desirableness of having a uniform pitch. Besides the very great inconvenience, and the often necessarily discordant results of having a variety of pitches, as at present, it appeared by the statements made at the meeting, by gentlemen competent to testify in such matters, that in England the pitch, or rather pitches now generally adopted, were considerably higher than that in use a century ago; that English instruments, generally, and those made in Paris for the English market were higher than those used in France; and Madam Goldschmidt (Jenny Lind), who attended in company with her husband, declared that the present high pitch was spoiling the voices we had, was one reason why we had so few good voices, and if the raising of the pitch went on as it had hitherto done, the human voice would loose its beauty and strength. A standard pitch had been adopted in France, and it was found to be lower also. Mr. Hullah, who is well-known to have had much experience in such matters, Sir George Smart, Mr. Otto Goldschmidt, and others, thought—in fact, it was evidently the opinion of the entire meeting—that the pitch should be lowered, and a standard the same as, or very similar to, the French should be adopted. The French pitch was middle C. 522 vibrations per second; Hullah's 512 vibrations, and Sir George Smart's and Handel's were somewhat lower. But the meeting considered it prudent, at that stage, merely to affirm a resolution—"That it is desirable that one uniform pitch should prevail."

AGRICULTURAL INVENTIONS.—John Young, of Joliet, Ill., has recently patented two inventions, the one a rotary plow, which as it moves forward divides the sod into thin strips by circular cutters; the sod is then raised in narrow slices and inverted by long tangential oblique set moldboards coming successively into operation: the other is a cultivator, which has a central share and two long side wings, which are set oblique to the line of draft and can be adjusted laterally to suit wide and narrow rows of corn, &c.; it also has a rake or harrow arranged behind the share and wings. This effectually cultivates the soil, removes the weeds and does its work remarkably well. They are two very useful inventions.

METAL SAILS FOR SHIPS.—Mr. F. Trevithick, of Penzance, has patented a curious pair of improvements in the sails and keels of vessels. He constructs the sails of strips or narrow bands of thin sheet metal. In applying keels fixed tubes are used at intervals, parallel with the center of flat-bottomed boats or vessels. Through these tubes chains are passed, to which the keels are attached, and other chains pass over the sides of the vessels, which are also attached to the keels, and by which the keels may either be lifted into the vessel or brought to act as lee-boards.

SALTING MEAT.—A French professor denounces the use of saltpeter in brine intended for the preservation of flesh for food. That part of the saltpeter which is absorbed by the meat, he says, is nitric acid—a deadly poison. He ascribes to this chemical change all the diseases which are common to mariners and others, who subsist principally upon salted meat—such as scurvy, sore gums, decayed teeth, ulcers, &c., and advises a total abandonment of saltpeter in pickle for beef, &c.; the best substitute for that article being a small quantity of sugar, which renders the meat sweeter and more wholesome.

CEMENT FOR HOLES IN CASTINGS.—The best cement for this purpose is made by mixing one part of sulphur in powder, two parts of sal-ammoniac, and eighty parts of clean powdered iron turnings. Sufficient water must be added to make it into a thick paste, which should be pressed into the holes or seams which are to be filled up, The ingredients composing this cement should be kept separate, and not mixed until required for use. It is to be applied cold, and the casting should not be used for two or three days afterwards.

TO MAKE GOOD BLUE INK.—Mix six parts of Prussian blue (carefully powdered) with one part of oxalic acid and a little water, and when the mixture is complete, add rain water so as to reduce it to writing condition. A little gum-arabic must also be added to prevent the ink running on the paper.

"IN HOSTS THEY COME IN LEGIONS MARCH AWAY!"

Subscribers continue to pour in upon us at but a slightly diminished rate from what they did three weeks ago, at the commencement of the New Series of the SCIENTIFIC AMERICAN; and in a corresponding ratio the first three numbers of the new volume are disappearing from our shelves. Of Nos. 1 and 2 we have less than *one thousand* left; and therefore we again admonish those who are delaying their remittances for a few days longer, with the view of forming still larger clubs, or because it is not quite convenient to remit the money immediately, that we fear some of them will be disappointed by not getting the back numbers. We assure the public that the SCIENTIFIC AMERICAN will continue to be the best as well as the cheapest scientific and mechanical journal published in the world; and many persons, who regard it as an invaluable work, but who are delaying to subscribe, thinking "there will be time enough by and by," will be unable to obtain the volume complete, we fear. So, friends, send on your subscriptions *at once*, and admonish your neighbors of the danger of delay, if they value the paper as a work of reference and ever intend to become subscribers.

IMPORTANT TO GARDENERS.

A gardener having occasion to newly paint the woodwork in the interior of his greenhouse, determined to make trial of the theory of the absorption of heat by black color, with the view of promoting the maturity of his plants and shrubs by means of a greater quantity of caloric. In the preparation of the black paint he used coal tar, that is to say, tar produced by the distillation of coal in the manufacture of gas. This coal tar, besides the advantage of its color, offers considerable economy in painting, being about one-eighth of the price of the material generally used in mixing black paint. The painting here in question was executed before the setting in of winter. On the return of spring the gardener observed, with no less surprise than satisfaction, that the spiders and other insects which had infested his greenhouse had totally disappeared. He, moreover, remarked that a vine, trained on an espalier which, for the space of two years, had been sensibly decaying, and which he had purposed to uproot for the purpose of planting another in its place, had acquired such renewed health and vigor as to be capable of producing excellent table grapes. Having applied his new paint to the props, treillages and espaliers of all his sickly trees and shrubs, as well as those which, though in full bloom, were being devoured by insects, success again crowned his experiment. Caterpillars and snails disappeared as rapidly as the insects had vanished from the greenhouse. The fruits produced by the trees thus treated have elicited the approval and eulogy of purchasers. Similar experiments tried on the vineyards o. the Gironde have, it is said, been attended by the same excellent results.—*The Bulletin.*

CORK TREES IN CALIFORNIA.

The Patent Office having obtained seeds of the cork tree from Europe, sent several packages last year to California, which possesses a climate similar to France and Spain, where it flourishes. These seeds were planted at Sonora, and about 87 per cent. of them have come up, and give promise of becoming stately trees. Cork is one of the most useful and valuable articles connected with the arts, and we have no substitute which can take its place. We import annually about $209,500 worth of corks, and $18,000 worth of the bark of the tree. If this tree prospers in California, of course a considerable saving will be effected to the country, because we shall be able not only to manufacture all the articles of cork which we use ourselves, but we will not be required to import any of the raw material.

IMPROVED MOLDING-SAND.—A correspondent (J. W. Winter) of the *Dental News Letter* describes the following as a discovery which he has made in sand for molding:—

"Take equal parts of soapstone and Bristol-brick; pulverize finely, and mix them together. It it superior to any other molding-sand, as it requires but little moisture to pack it firmly, and you can get a finer impression, and can pour your metal at any stage of heat, without spoiling the mold."

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GARRETT'S COTTON SEED PLANTER.

In this invention a rotating toothed wheel is employed in connection with stationary stripping brushes, the wheel and brush being placed in the seed-box, so that seed can be planted in the same state as they are discharged from the gin, and the discharge of seed regulated as may be desired. In our illustration, Fig. 1 is a perspective view, and Fig. 2 is a section showing the interior. A, represents a rectangular frame, to the back part of which two handles, B, are attached, and to the front of which a projecting bar, C, is secured, this bar having two small gage wheels, *a*, affixed to it. Through the back part of the bar, C, at its junction with the frame, A, the shank of a furrow-share, D, passes.

The frame is mounted on two wheels, E, and a seed-box, F, is placed on the frame, the box being provided with a cover. To the back end of the frame a drop-frame, G, is attached, which has a roller, H, fitted within it, and to the under side of the frame A, a frame, I, is attached, at its front end, which is provided with harrow-teeth, *c*, attached to its back part, that may be kept in the ground by a spring, *d*.

J is a wheel which is placed in the lower part of the seed-box, F, and has teeth or rods, *e*, projecting from it in a somewhat tangential position. The axis, *f'*, of this wheel extends through one side of the seed-box, and it has a pinion, *g*, placed on it, that gears into a corresponding pinion, *h*, on the axle, *i*, of the wheels, E. The ends of the axis *f'*, of the wheel J, adjoining the pinion *g*, is fitted in a lever, K, the lower end of which is attached or pivoted to the frame A, and has a rod, L, attached to it. By this arrangement the pinion, *g*, may be thrown out of gear with the pinion, *h*, when desired.

At the bottom of the seed-box, F, and to each side of its front part, a stationary horizontal brush, *f*, is attached, between which the teeth or rods, *e*, of the wheel, J, pass as it rotates, and to each side of the seed-box F, an adjustable or sliding plate is fitted, each plate extending a trifle below the bottom of the seed-box, and adjusted higher or lower as may be desired by means of arms and a screw and nut.

The sides of the hopper are placed in inclined positions, so that, by adjusting the plates higher or lower, the discharge-orifice of the seed-box may be enlarged as occasion may require.

The operation is as follows:—The cotton-seed to be planted is planted is placed in the seed-box, F, and as the machine is drawn along the wheel, J, is rotated by the gearing, *g h*, and the teeth or rods, *e*, will draw the seed, which are covered with lint precisely the same as they came from the gin, from the box, the discharge of the seed being regulated by adjusting the plates so as to enlarge or contract the space between them. As the teeth or rods, *e*, pass upward between the brushes the latter strip the seed from them, as the lint causes the seed to adhere to the teeth or rods. The tangential position of the rods or teeth favors the action of the brushes on the stripping of the seed from the teeth or rods.

The share, D, wheels, *a*, harrow-teeth, *c*, and roller, H, perform their usual offices, viz: the wheels, *a*, regulating the depth of the furrow, the share, D, opening the furrow, the teeth, *c*, covering the seed, and the roller, H, pressing the earth upon it.

The difficulty attending the planting of cotton-seed by a machine has been owing to the lint which is attached to the seed and which the gin does not remove. The lint causes the seed to adhere together and prevents a free discharge of it; but by this invention this difficulty is obviated.

Fig. 2

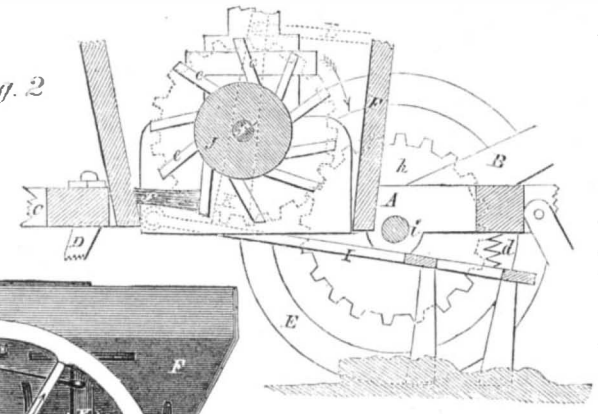
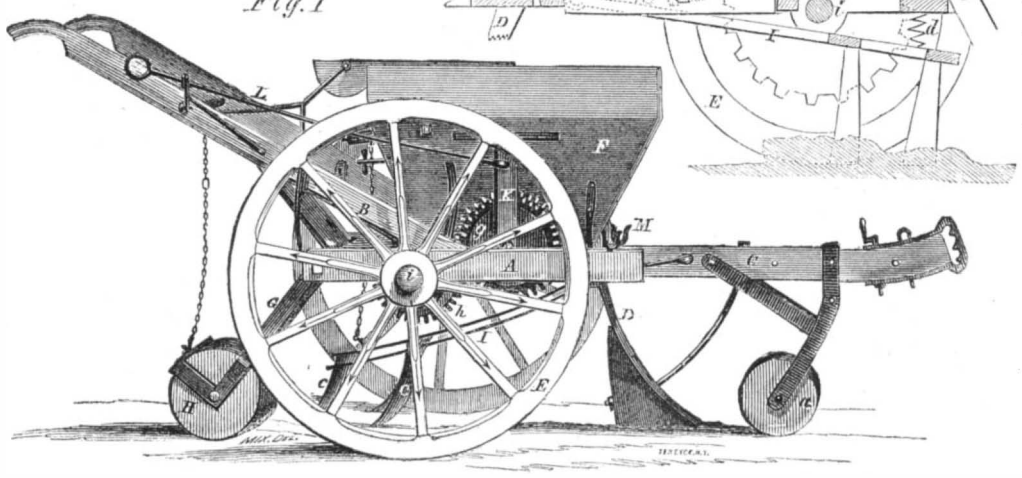


Fig. 1



GARRETT'S COTTON SEED-PLANTER.

The invention is by Charles C. Garrett, of Spring Hill, Ala., and he has arranged it in such a manner that it can be transformed into a corn-planter with very little trouble. The patent is dated March 8, 1859, and the inventor will be happy to give any further information upon being addressed as above.

BURNHAM'S TURBINE WHEEL.

Fig. 1

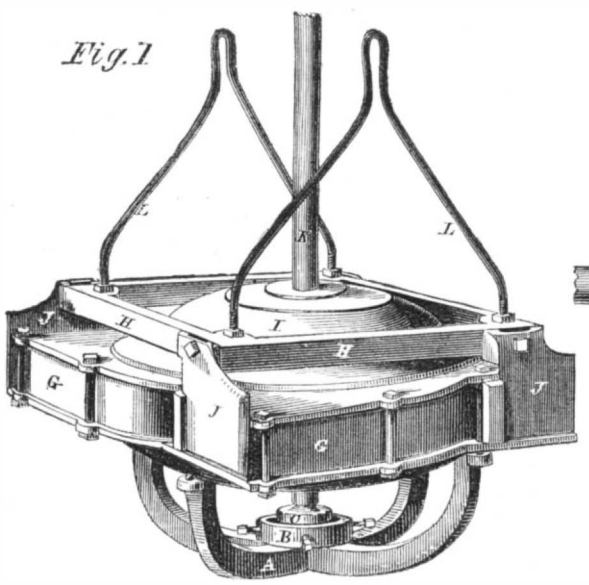
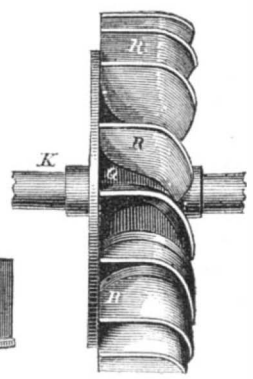


Fig. 2



IMPROVED TURBINE WHEEL.

When M. Jonval invented his turbine wheel and it was introduced into this country, it was manifestly a great improvement, and secured, after repeated trials, its general adoption over the turbines which, till then, had been in use. We have now to introduce our readers to an improvement on the Jonval wheel, invented by N. F. Burnham, of York, Pa., and patented by him Feb. 22, 1859. The improvement consists in new guides or chutes to conduct the water from the forebay to the movable or turbine wheel, and a concave hub to which the buckets are bolted, and a new shaped bucket that fits the concave hub, and is straight from the top downwards two-thirds its depth, and the other third is curved in spiral form to suit the velocity of the water.

In this improvement the water is admitted to the wheel at four distinct apertures that are closed or opened to admit any quantity of water by the gates, J, attached to the square, H, that can be raised or lowered by the suspending rods, L L. All these parts are seen in Fig. 1, which represents the wheel entirely ready for use. A is a cross made of cast-iron and secured to the curb by four large screw bolts, so that it can be raised or lowered as the case may require. B is a circle cast on the cross, and has four set screws to center the step accurately. C is a cast step-box, which holds the step. A curb is cast fast to the chutes, and is turned out at the bottom so the wheel fits closely to it. G G are the side of the chutes, which are made of boiler-iron, and fits the groove in the curb plate. I is the top cap that covers the wheel, and is bolted fast to the top chute plate. Fig. 2 shows the wheel. K is the shaft, Q the concave hub, and R R are the buckets. The step is of hard wood and requires no oiling. To give an idea of its value we cannot do better than quote from a letter sent to the inventor by some persons who are using it:—"The wheel is six feet in diameter under a six-foot head and face of water; it drives two pair of five-feet corn stones, and one pair of wheels easily burrs and grinds seven bushels of corn per hour to each pair of stones, the wheel discharging only 400 inches of water. This wheel replaced a breast wheel 18 feet wide and 20 feet in diameter, which drove only one pair of stones and took two-thirds more water than the turbine." The foregoing is a testimonial that will be appreciated by all mill-owners; and when the wheels, as in this case, do much more than they are guaranteed, they cannot fail to give satisfaction.

The inventor will be happy to give any further information upon being addressed as above.

FRENCH ZINC DRYER.—Guynemer has patented a siccative for zinc paints, consisting of one part of pure sulphate of manganese, one of acetate of manganese, one of calcined sulphate, and ninety-seven of oxyd of zinc, rubbed into a very fine powder. This dryer is added to the paint in the proportion of one or one-half of one per cent, or thereabouts.

PROCESS OF SILVERING BY CITRATES.—A new method for speedily covering articles with a coat of silver has been described by Mr. Masse in the *Technologiste* for January. Carbonate of magnesia is added to a sufficient quantity of citric acid dissolved in water, and when effervescence has ceased the same quantity of citric acid again. This solution is super-saturated with ammonia. The solution should be strong enough to dissolve 100 grammes of freshly-prepared oxyd of silver in the litre, to which are added three litres of water, and the mixture digested at a low heat to remove the excess of ammonia. After adding the twofold volume of water the liquid is ready for use, but should be first kept for 24 hours.

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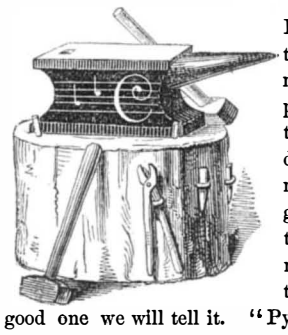
VOL. I., NO. 4.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, JULY 23, 1859.

THE FATHERS OF PHILOSOPHY—IV.



CERTAINLY as some of the early classic authors make the statement, and pertinaciously as many of their commentators endeavor to enforce the manner in which Pythagoras discovered or made the *octave* in music, we must be allowed to doubt the story; but as it is a good one we will tell it. "Pythagoras, while one day meditating on the want of some rule to guide the ear, analogous to what had been done to help the other senses, chanced to pass by a blacksmith's shop, and observing that the hammers, which were four in number, sounded very harmoniously, he had them weighed, and found them to be in the proportion of the numbers 6, 8, 9, 12. Upon this he suspended four strings of equal length and thickness, fastened weights to each of them respectively, in the abovementioned proportions, and found that they gave the same sounds as the hammers had done, viz: the fourth, fifth and octave of the gravest tone." This last did not make part of the musical system before; for the Greeks had gone no further than the heptachord, or seven strings, until that time. The frontispiece to a very celebrated history of music represents the Samian sage busy at work weighing the hammers. Notwithstanding that the hammers and anvils have been "swallowed" by some very great men, with an ostrich-like digestion, upon experiment it appeared that different hammers would no more produce different sounds on the same anvil than bows or clappers of different sizes will from the same string or bell. Galileo showed by experiment the fallacy of the whole story.

But though Pythagoras has been robbed of the honor of discovering musical ratios by accident, he has been given the still greater glory of discovering it by meditation and design, and there is no doubt that he did discover the harmonical canon or mono-chord, which was an instrument of one string well stretched on two bridges with a movable bridge in the center; and in applying this at various points of the line the sounds were found to be in the same proportion to one another as were the divisions of the line cut by the bridge. The common "hurdy-gurdy" is a similar instrument. It was by this invention that music took its rank among the sciences, as capable of being equally as well expressed in numbers or symbols as in sound.

He also added an eighth string to the lyre, which, as we have before stated, had previously had but seven. It is said by the writers of his life that the Samian sage regarded music as something divine, and that it had such a power over the human affections that he ordered his disciples to be lulled to sleep every evening and awakened every morning by the sweetest sounds. He preferred stringed instruments to the flute, because the performer could convey instruction to the mind while playing it, by accompanying it with the voice.

As a geometrician he was a distinguished man, and had studied astronomy while in Egypt. All his knowledge on these subjects he gave to his more exclusive followers, who were called "Mathematicians," and who were permitted to take notes of the lectures in writing, and to propose questions and make remarks on the subject of the discourse. Others of his followers he instructed in morals, social economy and politics; and he sent them into the cities of Greece to instruct the people in the principles of government, and to assist them in framing laws for the common good. He discovered the following theorems in geometry: that the interior angles of every triangle are together equal to two right angles; that the only polygons which will fill up a space about about a given point are the equilateral triangle, the square, and the hexagon; the first to be taken six times, the second four times, and the third three times; and that, in rectangular triangles, the square of the side that subtends the right angle is equal to the two squares of the sides which contain the right angle.

From his astronomical doctrine it has been inferred that Pythagoras was really the first person who was in possession of the true idea of the solar system which was revived by Copernicus and and fully established by Newton. His theological ideas were a wondrous mixture of reverence for a pure and holy Great First Cause or Essence, and a mass of symbolic superstition which he had not either the courage or knowledge to cast away.

In conclusion, it may be asked, "What good did Pythagoras do to the world?" He taught the value of numbers, promulgated an improved astronomy, introduced music as an ornament and necessity to civilized life, and lastly, told the people that to be a great man required goodness, and that there were no philosophers who were not virtuous. He and his followers were patterns of temperance, soberness, wisdom and chastity; and his voice was ever elevated in the cause of human freedom and of manhood's rights. In short, he was an Example for the Ages.

EXPERIMENTS WITH SCREW PROPELLERS.

A series of trials with screw propellers lately concluded in England are the most important that have taken place since the introduction of the screw for impelling steamships. The trials were undertaken to test the relative qualities of the common screw, with Griffith's propeller, which was illustrated on page 352, Vol. XII., SCIENTIFIC AMERICAN. Experiments had been made in 1853, having the same specific objects in view, but they were not so complete, especially as it related to the vibration and steering of the vessels. The common screw used by the British Admiralty consists of a sixth part of the whole helix; Griffith's propeller has a spherical central base, one-third the diameter of the screw, with the blades made tapering. The driving surface of the former is at the extreme ends of the blades; that o. the latter lies towards the center, nearest the sphere.

The first trial was with a common screw, which had a diameter of 18 feet; the speed obtained was 11,823 knots per hour. On a second trial, with its diameter increased to 20 feet, the speed was 11,826 knots, but there was a great increase of vibration. The leading corner of each blade was now cut off, and on the third trial, with this change, a speed of 12,032 knots was obtained. Both corners of the blades were now cut off, and a fourth trial made; but even with a greater number of revolutions, less speed—12,012 knots—was secured. The highest speed was, therefore, achieved with the leading corner of the screw cut oft. With a Griffith's propeller of 20 feet diameter and 32 feet pitch, the first trial gave 11,981 knots per hour; on a second trial, with an alteration of pitch to 26 feet five inches, a speed of 12,269 knots was the result; on a third trial, with a still further reduced pitch and 43¾ revolutions per minute, there was much less vibration than on former trials, but the speed was only 12,158 knots.

It was found during these trials that the leading edge of the screw is the part which affects the steering of a vessel most, and causes the greater part of the vibratory acion. It was also demonstrated that an increased diameter of the common screw was better than an increased pitch to reduce the speed of the engines, with an augmented speed in the vessel, but it had the effect o promoting the vibration, which is an evil to be avoided if possible. By increasing the diameter of the Griffiths' propeller additional vibration was not experienced, because its chief acting surface is not at the extremities of the blades. These experiments seem to have established the fact, that a propeller having a sphere at its central portion, combined with tapering blades, gives better results with less power than the common screw propeller.

A paper was recently read before the United Service Institution, in London, by James Reddie, Esq., on flexible screw blades, in which he stated that several successful experiments had just been made with a propeller which had wrought iron tapering blades, somewhat flexible in their character, and his object was to point out the advantages of such propellers. Our own attention has been several times directed to such devices, because they are the very agencies which have been provided by nature for the swift-moving tenants of the sea. Thus, if we examine the shape which the propeller (tail) of a swift fish assumes as it moves through the water, it will be observed to describe the figure 8, the one flexible lob bending to the one side and thence to the other alternately, describing a helix, and acting efficiently durin the whole length of the sculling stroke. Now why not imitate nature in ships, by the use of a flexible propeller, and a vibratory instead of a rotary motion? Among the earliest propellers that were tried was the duck's-fo reciprocating paddle of the Earl of Stanhope; but it was not a scientific device, because it only acted efficiently during the forward thrusting motion, and required to be collapsed on the return of the stroke. Could a propeller be constructed and operated like that of the swiftest fishes, it might or it might not be superior to all others. A ship is not a fish, and the same device to propel the one may not be so well adapted to propel the other. We advance this idea because it seems to have been overlooked by most persons who have treated and who now treat this subject. This is a most important question to our shipping merchants, because foreign screw steamers have recently taken away a vast amount of their business. Every improvement suggested for propelling vessels should engage their earnest attention; at the same time, we must tell them that it is not from mere speculation, but reflection and experiment, that most improvements result.

CHEAP SEWING MACHINES WANTED IN GERMANY.

The government of Wirtemburg writes to us (through M. Steinbeis, the Manager of the Board of Trade and Commerce at Stuttgart) as follows:

MESSRS. MUNN & CO.:—On page 193, Vol. XIV., SCIENTIFIC AMERICAN, there is an interesting article on "Sewing Machines," setting forth the immense number of these machines which are manufactured annually by various houses in the United States.

We are already in possession of sewing machines of the larger and more expensive kind, but of the smaller, at the price from $5 upwards (of which mention is made in the said article), we have as yet not seen any specimens. We would therefore be much obliged to you if you would have the kindness to send us the address of such American houses as chiefly manufacture small and low-priced (though perfectly well-working) sewing machines, and to also add their price-lists, as well as the price-lists of the large machines, both of which lists undoubtedly explain the size, power and other particulars of the machines and their use. It would, without doubt, be in our power to recommend those articles in this as well as in other countries of Germany, and to procure some orders for your friends or to the branch establishments which they may possess in Europe.

Signed (for the Board of Trade and Commerce of the Kingdom of Wirtemburg): STEINBEIS.

Stuttgart, June 23, 1859.

[We would suggest to our sewing machine makers that the opening here presented for introducing their machines into Germany seems to be a favorable one; and we would advise them to correspond with M. Steinbeis (addressing him at Stuttgart, Kingdom of Wirtemburg), and to send him their pamphlets of descriptions of their machines.

THE STEREOSCOPE AND FORGED NOTES.—A cotemporary states, that by means of the stereoscope, forgery can be readily detected in the case of bank-notes. If two accurately identical copies of ordinary print be placed side by side in the stereoscope they will not offer any unusual appearance; but if their be any, the *slightest* difference, that difference will at once be made manifest by the elevation into relief, or the reverse, of the corresponding space above the adjoining marks, and by this simple process a forged bank-note can at once be detected,

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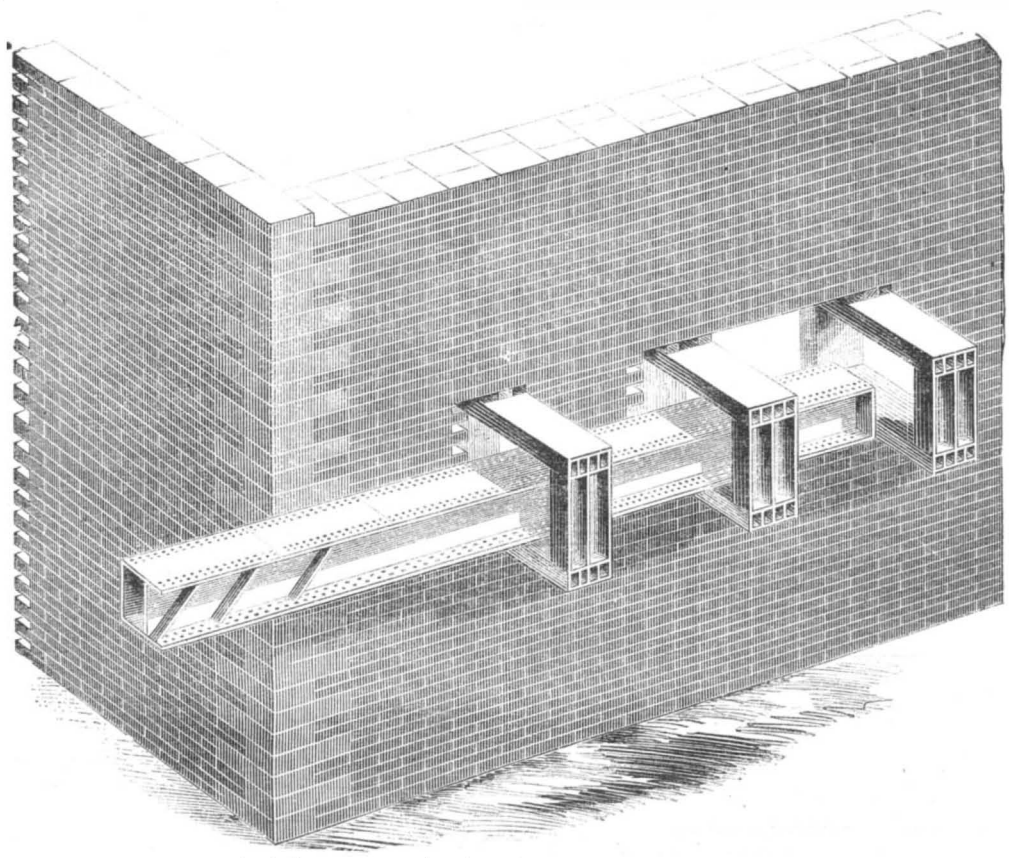
A NEW MODE OF SHORING.

Mr. Charles Geoghegan, the architect to the Royal Bank of Dublin (Ireland), has introduced an entirely new method of shoring, which will be of great value in this country where we so often change the location of our buildings or alter them in various ways. The intention was to remove a mass of brickwork from the base and support the superincumbent 200 tuns on wrought-iron beams and suitable pillars. This (as any architect or engineer will at once perceive) would, by the old method, have required a great amount of shoring, and would have been attended with no little risk; but by the adoption of this new system it was quickly achieved, and the cost of shoring eight walls was only $310 instead of $900, which would have been the expense by the old method. Holes were made in the wall and wrought-



iron squares, bolted together and made of "T" and angle iron, were inserted, and through these the beam was placed, as seen in our engraving; the remainder of the brickwork was then taken away and the beam placed in its position, and the wall built down to it. After this had "settled," the squares were unbolted and withdrawn and the brickwork below gradually removed to admit the columns; these, when placed, supported the beam and allowed of more brickwork being removed, until all the columns were placed and secured, and the whole was successfully performed without any accident or failure. The beam itself was cellular, and had flanges projecting from it to give sufficient breadth to support the brickwork above.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The Annual Convention of this Association is to be held this year at Springfield, Mass., and will commence on the 3rd. of next month. It is expected that there will be a very large gathering of the *savants* from all parts of our continent, and that a very great number of papers on different subjects will be read and discussed; we hope they will be valuable. The programme so far as decided on, is as follows:—On Wednesday, August 3rd., after an opening prayer, Mayor Calhoun will deliver an address of welcome, to which Professor Stephen Alexander will respond. After transacting general business, the association will divide into sections for the reading and discusssion of papers. In the evening, the members will be invited to entertainments at private houses. On Thursday evening, an entertainment will be given at the City Hall, under the auspices of a managing board of ladies. On Friday evening, Professor Caswell, of Brown University, who was the acting president of the last meeting, will deliver an address at the City Hall. On Saturday afternoon, an excursion will be made to Amherst, when the members will examine the mineralogical and other collections, and partake of a collation proffered by the college authorities and citizens. The people of Springfield are making extensive preparations for their guests, and a "grand time" is expected.

THE COLLINS STEAMERS.

This once famous line of steamers, after having been lying in our docks idle for more than a year past, has (it is reported) been sold to the Pacific Mail and Panama Railroad Company for the sum of $1,000,000. This is actually less than the cost of one of the steamers (the *Adriatic*), and the loss must be very heavy to the owners. When the special government grant for carrying the Atlantic mail was rescinded, these steamers were unable to run and clear their expenses; hence they were laid up in their docks.

At one period this line bore a high reputation, and contended for the mastery of the seas with the famous "Cunarders." In the long struggle the latter were successful because they were sustained by their own government; and at the same time they were also more ably managed. The Collins Company lost two of their best vessels—the *Pacific*, which went to sea and never was heard of afterwards, and the *Arctic*, the tragic fate of which will never be forgotten. There are three vessels left; and of these, the *Adriatic*, which was intended to be the swiftest steamer in the world, has only made one complete voyage across the Atlantic ocean.

FRENCH FIELD TELEGRAPH.—A war correspondent of the *London Globe*, writing from Brescia on the 24th June, reports that the remarkable precision and unity of the French evolutions were accomplished by aides-de-camp. From each corps, once in a position, a horseman rode off to the next division unrolling on his rapid course a light wire, which was quickly attached to a field apparatus; and the process was repeated all along the French line of twelve miles. Hence the movement of the whole army was known and regulated like clock-work, "from dawn to dewy eve," on that decisive day. This arrangement had been planned in Paris, and a supply of gutta-percha-covered metal thread forwarded with secrecy and dispatch. Besides this field telegraph, a flying telegraph corps are spread over the whole country behind the allies, to communicate with all parts of the country and the capitals of France and Piedmont. We have been informed that the Austrians use a similar field telegraph and in this respect are on equal terms with the French. We know that such a flying telegraph was made part of the drill in Austria several years ago, when the army was out on review.

STARCH IN FLOATING DUST.—M. Pouchet, a European *savant*, has found that the dust floating in the air contains the detritus of the mineral constituents of the globe, atoms of animals and plants, and the finest *debris* of all the matters we make use of. Wheat-starch is invariably found in the dust, whether old or recent. Surprised at the quantity of it present among the aerial corpuscles, M. Pouchet investigated the dust of all ages and of every locality, and everywhere he found this wheat-starch presented. He says: "I have found the starch in the most inaccessible corners of old Gothic churches, mixed with dust blackened by six or eight centuries of existence; I have found it in the palaces and caves of the Thebaid, where it may have dated from the time of the Pharaohs! I have found it in the tympanic cavity of the tympanum of a mummified dog, which I discovered in a subterranean temple of Upper Egypt. In all countries where wheat forms the staple of food, starch always penetrates into the dust, and is met with in greater or less quantities. Hence, therefore, the corpuscles of which we have heard so much are granules of starch and silica." Twice only in a thousand experiments has M. Pouchet observed the large ova of infusoria in the atmospheric dust.

ALLOYS OF ALUMINUM.—Several of our jewelers and others have lately been endeavoring to make alloys with aluminum and other metals, and with very poor success. As a consequence we have been frequently interrogated on the subject, for the purpose of pointing out where the difficulty of forming such alloys lay, and how to remedy the evil, if it were possible. A patent lately taken out in England, by E. L. Benzen, of Sheffield, will perhaps throw all the necessary light on this subject that is required. He makes alloys of aluminum or its oxyd and other metals by means of carbon in the presence of the metals: thus, he places an ounce of aluminum and an ounce of copper or iron (or any metal electro-positive to aluminum) in a crucible mixed with about half an ounce of carbon in the form of powder, when they are placed in a furnace and submitted to reduction by a suitable heat applied for this purpose. The metals are stirred gently while in a state of fusion until their intimate union is effected.

IMPORTANT BIBLICAL DISCOVERY.—Professor Tischendorf, who was sent by the Russian government on a journey of scientific exploration, in a letter from Cairo, dated the 15th of March, states that he has succeeded in making some valuable discoveries relative to the Bible, the most important of which is a MS. of the Holy Scriptures, of the fourth century, probably as old as the Vatican Manuscript, which hitherto maintained the first rank. In 346 beautifully fine parchment leaves (of such size that only two can have been cut out of one skin) it contains the greatest part of the Prophets, the Psalms, the Book of Job, the Book of Jesus Sirach, the Proverbs, the Song of Solomon, and several of the Apocryphal Books of the Old Testament, and the whole of the New Testament.

METALLIC WATER-PIPES.—The *Hartford Times* tells us that a Mr. Gilfillan, plumber, has shown them four kinds of water-pipes, which have lately been taken from the ground, viz.: 1. Iron pipes, 1¼ inch, has been used nearly three years, and is so choked with rust as to impede the flow of water. Three-fourths of the aperture is filled with rust. 2. Zinc pipe, ¾ inch, has been used five months, and the outside shows decided marks of decay: inside clear. It could not, evidently, have lasted many years. 3. Lead pipes, heavy 1 inch, has been used for fifteen years: perfectly clear and no decay. 4. Lead pipe, light ¾ inch, has been used ten years: clear and no decay.

STREET ENGINES.—The inhabitants of Liverpool (England) were recently somewhat astonished at the presence of one of Boydells' common-road engines in their streets; the engine drawing eleven wagons and moving at the rate of eleven miles per hour. It had been built at Manchester, and was under the perfect control of the driver in turning the corners of streets and in being suddenly stopped. It seemed to give complete satisfaction in regard to its powers and management, and it was hoped it could be employed in drawing heavy loads on the docks.

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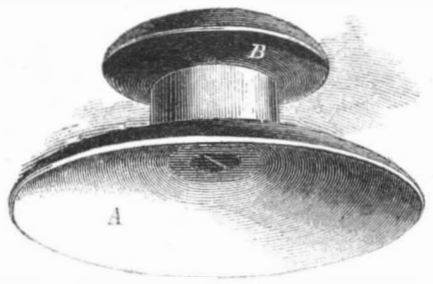
MINERAL OILS.

The manufactures of coal-oils have increased with such rapidity that their development appears to be something like a phenomenon. About ten years ago, nearly all the oils that were employed in artificial illumination, were obtained from monsters of "the great deep;" and our hardy whalemen had made the distant Pacific ocean and the Frozen seas of the North their aquatic hunting grounds. But with every recurring year their dangers seemed to increase, while their products as manifestly decreased, and the supply was becoming so limited that general apprehensions were excited as to obtaining a sufficient quantity from any other source. It is true that oils from oleaginous seeds, resin and the fat of domestic animals were well known and to a limited extent used; and although it was thought by some persons that they might be increased to a boundless extent, the feeling was predominant that unless some new discovery was made, a deficiency of oil would certainly be felt. It was at this juncture that a discovery was announced which met the public requirements, and which, for novelty and usefulness, has few if any equals. This invention was nothing less than producing oil from *bottled-up sunlight*—the distillation of it from the submerged forests of former ages, which, in the shape of coal, had been buried in the bosom of the earth for thousands of years. The light of the sun was necessary for the antediluvian coal-vegetation to condense carbon and hydrogen; hence it is truly this absorbed light of ancient days which now gives forth its cheering beams from our coal-oil lamps!

The first account which we have of this oil, is contained in the patent of J. Young, published on page 186, Vol. XIV., SCIENTIFIC AMERICAN; and although it has been said, that such oils were previously known, we have searched in vain for a record of the fact. It is now only nine years since this discovery was made known to the world, and at that time (1850), not a pint of the oil had been manufactured in our country, nor was there any made for four years afterwards, so far as we have been able to learn. What is the fact now? More oils are made from coals in one week, in our country, than ever was obtained by our whale-fishers in the best year's fishing they ever enjoyed. At present there are large oil manufactories in the cannel-coal districts of Virginia, Kentucky and Ohio, and a great quantity is now made in the neighborhood of this city. The oldest factory of this character in this region, is the kerosene-works near the eastern district of Brooklyn, on Long Island. It is certainly a wonderful place, both on account of the original method of distilling the coals, and the vast extent of the premises. Three years ago, a few pounds of coal, according to the common methods, were here distilled in the old fashioned retorts, now there have been erected several rows of retorts, each of which contains 25 tuns of coal and this amount is worked off as a regular charge at one operation. The principle of action embraced in these retorts is totally different from all others; it is exactly the same as that of smoking a pipe of tobacco, and on this account it is called the "meerschaum." Each of these retorts is built of brick, in the form of a huge pipe-bowl and when the coal is packed in, the fire is kindled on the top with anthracite. The draft of the heated products down through the coal is effected by steam power, and the oil vapors that are carried off below are condensed into crude-oil and pass from a conducting pipe into a tank. The process is a strange one indeed; here steam is applied to a new purpose certainly—that of "smoker" on a grand scale for the production of oil for our lamps. The operations are under perfect regulation to prevent the cannel coal undergoing combustion. At these works there is one of such retorts now in the course of erection, which will be able to smoke 100 tuns of coal at one operation and there is no reason that can be urged against applying the principle on a still larger scale, By the middle of next September arrangements will be completed for making 5000 gallons of kerosene-oil per day at these works or over 1,500,000 gallons per annum; and from this single fact the public will be able to form some idea of our great and growing oil manufacture.

A SELF-SUPPORTING BRACKET.

Every one knows how the principle of atmospheric pressure is illustrated by a toy called a sucker, which the boys make with a piece of wet leather and a string passed through the center. The principle has just been applied, in an analogous manner, as a means of fixing a piece of metal in a moment to a wall or ceiling, or the glass of a window. "Lavater's Patent Pneumatic Bracket" is a short brass tube, having at one end sockets in which may be inserted any light frame branches or hooks, and terminating at the other extremity in a trumpet-like expansion, which is covered with a disk of india-rubber. In the center of the disk is attached a smaller one of metal, which can be drawn within the tube by a screw proceeding from a cap that fits over the smaller end of the tube. When the screw is relaxed, the india-rubber disk is flat. Apply it then to the wall, after moistening it with the breath, turn the screw, and the metallic disk, carrying the india-rubber with it, recedes from the wall, and thus causes a vacuum capable of sustaining a weight in proportion to the area of the trumpet-like expansion. The bracket may be detached in a moment, and, it is said, will leave no mark behind it. By means similar to this, any number of brass rods may be secured to a window to hold light articles. This is said to be an English invention, and we copy it from the London *Builder*. The



idea, however, is American, as the accompanying engraving will show. A is a disk of rubber with a handle of wood, B, the whole forming a most convenient little article to have upon the table, as with it drawers without handles can be opened by simply pressing it against the drawer, and then pulling the drawer open. This little device has been in use here for some years, and it prevents the tearing of clothes, knocking of knees and other inconveniences that arise from the handles o drawers.

FOREIGN SUMMARY—METALS AND MARKETS.

A huge new iron war-ship, called a "war steam-ram," is now being constructed by the British Admirality. Its length will be 380 feet, breadth 58; capacity 9000 tuns; and its propelling power will be sufficient to drive her at the rate of 16 knots per hour. She is to be built of teak wood covered with iron plates 4½ inches thick, and the armament is to be 35 large Armstrong rifled guns, each having a range of *six miles*. It is intended, not only to blow other ships to pieces, but to run them down by its superior momentum. Its cost will be $1,600,000. May it never be required for the purposes that have led to its construction, is our humble wish

The *Great Eastern*—once the *Leviathan*—is being rapidly pushed forward towards completion. The decks are now planked from end to end, three of the masts are up, the machinery is in, and the funnels erected. The grand saloon is in a very forward state, and one of the cabins has been finished. This completed department is what is called a "family cabin" containing bed-room, sitting-room and dressing-room, all of them lofty and well ventilated, and possessing a much greater number of conveniences than could be found in a similar suite on shore. The other cabins are also in an exceedingly forward state, and as an immense number of men are kept incessantly at work, there is every prospect of the ship being ready for her trial trip on the 4th of next month. If that trip is successful, she will soon afterwards cross the Atlantic. Her immense proportions now fill the eye more fully, and by the side of other first-class ships in the Thames, she appears almost like a mountain among mole-hills.

There are 2,046 cotton factories in England, of which 1,480 are in Lancanshire; Manchester being the metropolis of this business. The cotton manufacture of Scotland is confined to two counties—Lanarkshire and Renfrewshire, and it has been nearly stationary for the past two years; in Ireland, where it is confined to Antrim, it has lately fallen off, but in England it has greatly extended.

A railroad bridge of great strength and beauty, which has been two years in course of construction over the Nile at Kaffr Azzeya, (Egypt), has just been completed. It is composed of iron and was built by Messrs. R. Stephenson & Co., of Newcastle, England.

PRICES OF FOREIGN METALS, JULY 1.

	£	s.	d.		£	s.	d.
Staff. bar-iron, per tun..	8	00	00	Swedish steel, in faggot	21	00	00
Common English....	7	00	00	Copper in tile.....	107	10	00
Single sheet.....	9	10	00	British pig lead.....	22	15	00
Double sheet.....	11	00	00	Tin, block.....	129	00	00
Round nail rod.....	8	00	00	Bar.....	130	00	00
Square nail rod.....	9	00	00	Banca,.....	134	00	00
Hoop iron.....	9	00	00	Plates (per box).....	1	19	00
Welsh iron rails.....	5	15	00	Spelter.....	19	00	00
Staffordshire pig-iron...	3	10	00	Zinc, in sheets.....	28	10	00
Scotch pig-iron.....	2	8	00	Copper sheathing, per lb	00	1	00
Swedish iron.....	13	00	00	Brass sheathing.....	00	00	10
Swedish steel.....	20	10	00				

English tin was more enquired after since our last, and lead was in good demand; the demand for tin plates for America was much improved, but there were very few orders for rails.

Orders for the best qualities of malleable iron, from America, are very good at present; boiler-plates, sheet bars, and hoops are in greatest request.

The French iron trade is in a very depressed condition; the prices in markets are stated to be lower than the first cost of making the metal. This depreciation in the prices is attributed to the war in which France is ingaged with Austria.

For these commercial statistics we are indebted to the London *Engineer* and *Mechanics' Magazine*.

New York Markets.

COAL.—Foreign cannel, $8; Anthracite, from $4.50, $4.75, to $5.

COTTON.—The market has been quiet, with a fall of one-fourth of a cent from last week's prices. Good ordinary Upland, Florida and Mobile, 10¼c.; Texas, 10½c. Middling fair from $12⅜c. to 13⅛c.

COPPER.—Lake Superior ingots at 21c. per lb. for cash. Copper bolts, 30c. Sheathing, 26c.

FLOUR.—Genesee extra brands, $6.75 a $8.75; Ohio choice, $7.70 a $8; common brands from $5 up to $6.70.

HEMP.—American undressed, $140 a $150; dressed from $190 a $210. Jute, $95 a $90. Italian scarce. Russian clean, $210 a $215. Manilla 6⅝c. a 6¾c. per lb.

IRON.—Anthracite pig, $21, $22 and $23 per tun; Swedish bar, $85 a $86, and English refined, $52.50 a $54.50. Russian sheet, first quality, 10¾ a 11¼c. per lb.

LEAD.—Galena, $5.75 per 100 lbs.; German and English refined, $5.70.

LEATHER.—Oak slaughter, light, 34c. a 36c. per lb.; Oak, heavy, 33c. a 35c.; Oak, crop, 40c. a 42c.; Hemlock, middle, 25c¼. a 26½c.; Hemlock, light, 25c. a 25½c.; Hemlock, heavy, 23½c. a 24½c; Patent enameled, 16c. a 17c. per foot, light. Sheep, morocco finish, $7.50 a $8.50 per dozen. But a moderate business in oak and hemlock.

NAILS.—Cut are quiet but steady at 3⅛c. a 3¾c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wrought foreign, 3c. a 3½c.; American horseshoe, 15c. a 20c.

OILS.—Linseed oil, 61c. a 62c. per gallon; whale, bleached, 55c. a 57c. a 63.; sperm, crude, $1.30, $1.35, and $1.40; lard oil, 93c. a 94c.; refined rosin, 30c. a 40c.; coal, refined, $1.12 a $1.25; camphene, 44c. a 46c.

RESIN.—Common, $1.82½ per 310 lbs. bbl.; white, $3.75 a $4.50 per 280 lbs.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

TIN.—Banca, 31½c. per lb. Plates per box, $7.12 a $9, according to quality—a decline from last week.

ZINC.—Sheets, at 7c. a 7¾c. per lb.

The foregoing rates indicate the state of the New York markets up to July 14.

The demand for cotton has somewhat improved, especially for the higher qualities.

The prices of flour are very irregular; every arrival from Europe seems to denote a decline in prices.

Refined copper is in but moderate request. Lead is somewhat stiffer.

Mr. Charles Minot, formerly Superintendent of the New York and Erie Railroad, having associated several gentlemen with him, has submitted a proposition to the company which manages this railroad, to lease it for a term of ten years, agreeing to pay for it, $1,500,000, the first year; $1,600,000, the second, $1,700,000, the third, and so on with an annual increase for ten years. We hope this proposition will meet with that attention which it deserves, as an entire change in the management of this railroad is imperatively demanded.

The Mississippi Central Railroad which is 200 miles long, will soon be completed, and will then afford continuous railroad communication between this city and New Orleans. It is stated that it will be built and equipped at a cost not exceeding $20,000 per mile. If well managed this road should be one of the most profitable in the Union.

The Boston trade sales (alluded to by us in a former number) have commenced, and are being continued as we pen these lines. An immense crowd of buyers were present on the 14th inst. and 15,000 packages of dry goods valued at 1,500,000, were sold. The bidding was spirited, and it is stated "the merchants appeared satisfied." On the same day 3000 cases of boots and shoes were disposed of, also a great quantity of Horace Day's india-rubber goods.

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Patent Claims

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JULY 12, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

24,708.—E. H. Angamar, of New Orleans, La., for an Improvement in the Mode of Staying Piles for Wharves, Piers, &c.:

I claim, in combination with the piles, the frames, s s, and sleeves, a, and the braces, b, when made and arranged as or substantially as and for the purpose set forth.

24,709.—S. T. Bacon, of Boston, Mass., for an Improvement in Locks:

I claim the construction of one or more pistons, or drivers, or both; also one or more holes in the rotating tumbler or surrounding cylinder, or both, substantially as and for the purpose specified.

24,710.—S. T. Bacon, of Boston, Mass., for an Improvement in Bank and Safe Locks:

I claim, first, Arresting and holding the tumbler in an an exact locked position.

Second, Preventing the displacement of the tumbler, in the direction of unlocking by means of pins, 1 1 1 1, in combination with the sliding bottom key-hole guard and the tenons.

Third, Preventing the displacement of the tumbler at and beyond the locked position, by means of the slotted collar in combination with the cylinder, the tumbler and the tumbler pin.

Fourth, Preventing the displacement of the tumbler inwardly, by means of the collar in combination with the cylinder and the bolt of the lock.

Fifth, Enlarging the piston holes throughout the lock for the purpose specified.

Sixth, Enlarging the holes in both tumbler and cylinder, in each direction from the dividing line between them for the purpose specified.

Seventh, Constructing the key-hole guard of two or more pieces of metal hardened for the purpose specified.

Eighth, Making one or more chambers between the several parts of the key-hole guard; for the purpose specified.

Ninth, Dividing the air-chamber, or chambers, with one or more narrow ridges, for the purpose specified.

24,711.—Joseph M. Batchelor, of Foxcroft, Maine, for an Improvement in Lamps:

I claim the arrangement and combination of adjustable tube, B, with the wick, L, button spindle, F, spur wheels, D J, and friction spring, H, or the equivalents thereof, as set forth.

[The stem of the button spindle has arranged on it in connection with the small spur-wheel usually employed for raising the wick, a larger spur-wheel gearing into a rack projecting from the side of the wick tube, so that the wick and tube can both be raised or lowered by turning the bottom spindle in exact relative distances to produce the proper amount of light required.]

24,712.—John T. Bever, of Haynesville, Mo., for an Improvement in Devices for Training Pea Vines:

I claim the posts, B B, when forming a box as described, and combined with cords, g g, rope, f, and pegs, h h, the whole constructed and arranged in the manner and for the purposes set forth.

24,713.—D. E. Bishop, of New York City, for an Improvement in Railroad Chairs:

I claim the formation of a bridle, A, in the center of the continuous lift, D, of a railroad chair, constituting a new article of manufacture, as described.

24,714.—J. L. Booth, of Cuyahoga Falls, Ohio, for an Improvement in Grain Separators:

I claim the box, A, provided with an inclined bottom or flooring and adjusfable strips, or valves arranged to operate, substantially as and for the purpose set forth.

[This invention relates to an auxiliary device to be applied to grain separators that separate grain by projecting it against the air, and is more especially designed to be used in connection with a grain separator that was patented by this inventor, March 8, 1859. In this patented machine the sound grain is separated from the light and inferior grain in consequence of projecting it by certain mechanism forcibly against the air; the sound grain, by its superior gravity, being projected further than the light. The object of the present invention is to receive the grain, both the sound and light portions, as it is projected from the machine, and to more fully separate and to collect it into distinct parts, and to graduate the separation as may be required.]

24,715.—J. Borton, of Middlebourne, Ohio, for an Improvement in Rat Traps:

I claim the combination of the spring doors, D D, rods, O O, dog, d, and rod, r, when arranged substantially in the manner and for the purpose set forth.

24,716.—Chas. B. Bristol, of Naugatuck, Conn., for an Improved Combination of Flesh Fork and Skimmer:

I claim, as a new article of manufacture, the combination of the fork and skimmer, when constructed, attached and fitted for use, substantially as described.

24,717.—J. H. Butler and P. G. Van Houten, of Cohocton, N. Y., for an Improved Mode of Operating Farm Gates:

We claim actuating the traps, L L, by means of the weight, M, and cord, o, arranged in combination with the lever, F, or its equivalent, for opepating automatic gates, substantially in the manner and for the purposes shown and described.

We also claim the construction and operation of the double-acting latch, in combination with an automatic gate for carriages, substantially in the manner and for the purpose set forth.

24,718.—Ansel Cain, of Holyoke, Mass., for an Improvement in Walking Canes:

I claim the combination of the lamp, constructed and arranged in the manner described with the walking cane, for the purpose set forth.

24,719.—J. H. Case, of Lyons, N. Y., for an Improvement in Hanging the Bodies of Vehicles:

I claim the combination of the metallic springs with thorough braces, substantially in the manner and for the purpose set forth.

I also claim the combination and arrangement of the combined thorough braces, a b, with the circular body, E, and supplementary spring, G, substantially as and for the purpose described.

24,720.—Matthew Chambers, of New York City, for an Improvement in Skirt Supporters:

I claim combining with and securing to a corset-band extending in the rear, or in the rear and front downwards from the waist, to clasp the body around the hips of the wearer, the framework of a skirt or bustle, when said framework is composed of hoops disconnected and fastened in front, or thereabouts, substantially as described and for the purposes set forth.

24,721.—Denison Chesebro, of Syracuse, N. Y., for an Improved Mode of Telegraphing from Railroad Cars while Moving:

I claim the combination of a sufficient number of pendants, arranged as described, and each having a movable vertical tongue, as described, and so constructed as to admit of a telegraph wire being attached to each of them in the particular manner specified with the metallic plates, wood scantling, or equivalent, and conducting internal wires attached to the roof of a railroad car, the whole being constructed, operated and operating in the manner described and for the purposes set forth

24,722.—Wm. A. Clark, of Bethany, Conn., for an Improved Device for Fastening Cutters of Hollow Augers:

I claim the angle wedge, e, in combination with the cutters, face plate, screws, c, and ledges, H, substantially as described and for the purposes set forth.

24,723.—David Cook, of New Haven, Conn., for an Improved Fruit Basket:

I claim making a metal bound wooden fruit basket, either plain or ornamental, when constructed and fitted for use, substantially as described.

24,724.—John Davis, of New Bedford, Mass., for an Improved Mode of Connecting the Ends of Railway Bars:

I claim, first, Connecting the rails of railroads in continuous chains with hinge joints in any practical mode.

Second, I claim securing the rails in the couplings, by inserting wedges longitudinally under the rails, and clinching their margins.

Third, I claim wedge, D2, in Fig. 2, to secure wedge, D3, in Fig. 3, and vice versa, by means of the hinge joint, or bolt, C, in Fig. 1.

24,725.—Perry Davis, of Providence, R. I., for an Improvement in the Wheels of Buggy Boats:

I claim arranging paddles upon the spokes of the wheels of a buggy boat, so that the wheels perform the twofold purpose of paddle-wheels and carriage-wheels, substantially in the manner and for the purposes set forth.

24,726.—W. C. Ellis and J. N. White. of Springfield, Mass., for an Improvement in Revolving Fire-arms:

We claim the projection, C, at the bottom of the chambers of the cylinders on which the fulminate of the cartridge rests, and is struck by the hammer in the discharge.

We also claim the flange, B, of the cartridge parallel with the barrel, the two in combination, for the purpose specified.

24,727.—L. C. England, of Oswego, N. Y., for an Improvement in Apparatus for Tanning:

I claim, in combination with the leach-vat and the conveyer trough, the pair of rollers to crack the wet bark, before it is delivered into the leach vat, substantially as set forth.

24,728.—Daniel Fitzgerald, of New York City, for a Fireman's Ladder:

I claim, first, Suspending a ladder upon the standard, E, so that it may be elevated and turned in any direction, constructed and arranged substantially as described.

Second, The arrangement of the branch pipes, C, with the stop-cocks, K, for use, at various hights, as described.

Third, I also claim making the main-pipe, B, serve as a hand-rail to the ladder, and to give it stiffness, by setting it up a little above and parallel to it, as described.

24,729.—W. A. Foster, of Chester, Conn., for an Improved Method of Hanging Pictures, Looking-glasses, &c.:

I claim adjusting picture frames, or mirrors, to different positions and at different angles, by means of a central hinge and levers, substantially as described for the purposes set forth.

24,730.—M. J. Gallager and Wm. H. Gladding, of Savannah, Ga., for an Improvement in Breech-loading Fire-arms:

We claim forming the chamber in the barrel and breech of the gun of the shape of two frustrums of cones, or of a frustrum of a cone, and a section of a parabolic spindle, whose bases meet at or near the line of the joint between said barrel and breech, for the purpose of containing a cartridge case of the form, substantially as represented.

24,731.—Joseph Gasser, of Toledo, Ohio, for an Improved Clothes Frame:

I claim the arrangement of the braces, D, and arms, E, in connection with the standard, A, and legs, C, substantially as set forth.

24,732.—David Glover, of Cass township, Pa., for an Improved Dumping Car:

I claim the construction of a revolving tip placed upon a movable frame or truck, the side pieces of which form, at a certain stage of the operation, a continuation of the main track or foundation, by means of which the wagon or car can be taken, without handling, from the main track or foundation, with the load, moved to the place required, and there dumped in any direction, substantially as and for the purposes set forth.

[This invention consists in a movable truck, which has the upper side timbers of its frame constructed to form a continuation of the railroad track when the loaded car is being run from the track on to the truck, and in combination with this the invention consists in having the truck constructed with a turn table, so that after the truck has received the loaded car, and carried it to the dumping-off point, it may be turned round so as to dump the load in any direction desired. This is a very useful and perfect arrangement for use at mines and on railroad embankments.]

24,733.—Freeman Godfrey, of Grand Rapids, Mich., for an Improved Shingle Machine:

I claim the cams, G G, gearing into rack bars, F F, attached one to each end of the carriage, E, said cams being fitted in a yielding or adjustable center-poised frame, I, and operated from the power lever, D, through the medium of the pawl, O, ratchet, M, and gearing, l m, substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of shingle machines in which a reciprocating knife is used for riving the shingle from the bolt. The invention consists in a novel means employed for feeding the bolt to the knife, whereby a simple automatic and positive feed movement is obtained.]

24,734.—Wm. Goodale, of Clinton, Mass., for an Improved Machine for Making Paper Bags:

I claim, first, Making the cutter which cuts the paper from the roll or piece of the form herein described, that, in cutting off the paper, it also cuts it to the required form to fold into a bag without further cutting out.

Second, The attachment of the former, F, directly to the cutter to operate in combination therewith, and with a folding table, C, substantially as described.

Third, The described mode of applying and arranging the paster, f, to operate in combination with the folding table, C, and former, F.

Fourth, The construction of the side-lappers with angular ends, e e, substantially as described, for the purpose of partly folding the side of the bag.

Fifth, The knock-off, I, operating in combination with the former, substantially as and for the purpose described.

Sixth, The vibrating frame, J, with its rollers, i i, operating in combination with the former and the knock-off, substantially as and for the purpose described,

Seventh, The arrangement of the table, the cutter, the former, the side-lappers, the bottom paster, the knock-off, and the vibrating frame, J, to operate in relation to and in combination with each other, substantially as described.

24,735.—Darwin A. Greene, of New York City, administrator of Elias Davis, deceased, late of New York aforesaid, for an Improved Machine for Splitting Fire-wood:

I claim the slabbing knife, a, and splitting knives, b c d e f, as secured to one cross-head, O, acting simultaneously at the forward movement of the latter, substantially as described and for the purpose set forth.

24,736.—Tobias Grodjinski, of New York City, for an Improvement in Dry Gas Meters:

I claim attaching each pair of the plates, B B', or their substantial equivalents, to the flexible part, C, of the diaphragms of dry gas meters, by overlapping parts of the one upon the other, substantially in the manner and for the purpose set forth and described.

24,737.—Geo. Hensel, of New York City, for an Improvement in Sewing Machines:

I claim the construction of the disk, W, with an elastic plate, R, attached and operated by means of a cam, in the manner and for the purpose substantially as set forth.

24,738.—S. Emilius Hewes, of Albany, N. Y., for an Improvement in Stoves:

I claim a revolving fire-pot, arranged to traverse perpendicularly or to be raised and lowered, substantially as described, for the purpose of supplying air to and shutting it from the openings in the sides of the fire-pot, so as to effect a ready and perfect combustion and consumption of the fuel.

24,739.—H. J. Holmes, of Warren, Mass., for an Improved Clothes-frame:

I claim a series of vertical frames, one of which has permanently affixed to it a foot-piece, A, and cap, B, when said cap and foot-pieces form suitable bearings for other frames, arranged and operating as and for the purpose set forth.

[A series of clothes-frames for drying clothes are combined together, so that each frame will have independent bearings in two segmental pieces, which form the foot and cap pieces, and so that, when the frames are closed or shut together, there will be a great economy of space.]

24,740.—John P. Hughes, of Spout Spring, Va., for an Improvement in Water-wheels:

I claim making the water arms in sections, essentially as described, for the purpose set forth.

24,741.—Anthony Iske, of Lancaster, Pa., for an Improved Dumping Wagon:

I claim the drop-door, D, with its lever, E, the partitioned box, A, with its rack-bar, c, on the bottom, the handled spindle, E K, for moving the same, as specified, when the several parts are combined as and for the purpose set forth.

24,742.—John W. Kennedy and John F. Plummer, of Plainfield, Conn., for an Improvement in Machines for Dressing Mill-stones:

We claim the arrangement and combination of the arbor, Q, forked arm, S, spring, T, shaft, U, ratchet and pawl, V W, wiper, N, bar, A, movable case, G, shaft, K, and adjustable plate, O, as and for the purpose shown and described.

[An engraving and full description of this invention will be published in a few weeks.]

24,743.—J. Kurtzeman, of Lancaster, Pa., for an Improved Head-block for Saw-mills:

I claim the sliding rack-bar placed longitudinally in the carriage, A, and adjusted therein by the wedges, e e, in connection with the gearing, H I F, whereby the two sides, C C, may, by a suitable adjustment of the wedges, be actuated both simultaneously and separately as may be desired.

[This invention consists in a novel arrangement of gearing for actuating the slides to which the dogs are attached, whereby both blocks may, by actuating a single lever, be moved or adjusted simultaneously, and the log set bodily to the saw and parallelly with its cutter's plane when "stuff" of equal thickness is to be sawed, or set obliquely with the cutting plane of the saw when "stuff" of taper form is to be sawed.]

24,744.—Wm. Lance, of Olney, Ill., for an Improved Method of Constructing Mallets:

I claim the manner of their construction and arrangement, as shown and described, for the uses and purposes set forth.

24,745.—John K. Leedy, of Woodstock, Va., for an Improvement in Bee-hives:

I claim, first, The boxes, e, constructed and arranged in the manner and for the purpose specified.

Second, I claim, in combination with the boxes, e, the pipes, E E and a b c, and their faucets, all arranged in the manner and for the purpose set forth.

24,746.—Robt. H. Long, of Philadelphia, Pa., for an Improved Salimometer:

I claim the means of drawing into a vessel water from a steam-boiler as a means to facilitate testing the density of the water in the same, constructed and arranged for the purpose substantially as set forth.

24,747,—A. G. Mack, of Rochester, N. Y., for an Improved Life-preserving Raft:

I claim surrounding a cask or chamber, A, with conical floats, B, arranged radially with said chamber and hinged thereto, and covering the cone with canvas, or other suitable material, and bracing the whole together by a rope, suitably arranged, all substantially in the manner and for the purposes specified.

[A cylindrical chamber, which is made water-tight, is surrounded with a number of radial floats hinged to the central chamber at determined points and braced by cords, so that the whole raft can be folded up like an umbrella when not in use, and the raft is covered with canvas, or similar material, to form a platform when the raft floats.]

24,748.—John Masury, of Brooklyn, N. Y., for an Improvement in Paint Cans, &c.:

I claim the construction of a metallic can for hermetically sealing

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paints and other substances, having attached thereto a rim or ring of thin brass, or other soft metal, in such a manner that the top or cover may be removed by severing the said rim or ring of brass, or other soft metal, with a penknife or other sharp instrument, in the manner and for the purposes described and represented, or its equivalent.

[An engraving and description of this invention will be published next week.]

27,749.—A. A. McMahen, of Oxford, Miss., for an Improvement in Earth-boring Augers:

I claim bracing the two ends of the spiral portion of the auger by means of the central rod, E, substantially in the manner and for the purposes described.

I also claim the manner of securing the boring tools, F G, rod, H, to the spiral, D, by which they may be removed and replaced without making any changes on the spiral, D, substantially in the manner and for the purposes described.

24,750.—Anton Menge, of Point a la Hache, La., for an Improved Dredging Machine:

I claim, first, The bucket frame, B, when resting upon adjustable casters or friction rollers, and operated so as to be swung from right to left of the boat upon a circular track, b, in combination with the oscillating shaft, C, all arranged and operating, substantially in the manner and for the purposes set forth.

Second, I claim the buckets, F, having a hinged back, T, arranged and operating for the purposes specified.

24,751.—F. O. More, of Bellefontaine, Ohio, for an Improvement in Preserve Cans:

I claim the peculiarly formed cap, B, in combination with the curved spring lip, E.

24,752.—Z. N. Morrel, of Cameron, Tex., for an Improved Portable Oven:

I claim forming the pin on the handle on the cover of a Dutch-oven or skillet, in combination with the tube under the center of the frying pan or gridiron, substantially as and for the purposes set forth.

24,753.—Chas. Neer, of Albany, N. Y., for an Improved Dynamometer:

I claim the combination of the rigid arm or arms, c, and yielding incline or inclines, d, with the loose pulley, a, or its equivalent, whereby the power exerted to rotate the shaft, a, is denoted by the motion resulting from the pressure against said yielding incline or inclines, for the purpose of forming a rotary dynamometer, substantially as specified.

I also claim the revolving and sliding cone, h, adjusted in its position according to the power applied from the pulley, a, to the shaft, b, when combined with a registering apparatus, substantially as set fortn, to record the amount of power made use of, as described.

24,754.—Charity Pendleton, of Galena, Ill., for an Improved Washing Machine:

I claim, first, The combination of the two horizontal bars or rails, J and M, having a circular reciprocating motion, with the fixed corrugated cylindric surface forming the bottom of the machine, and having its axis co-incident with the axis of motion of the said bars, J and M, the parts being constructed and arranged as hereinbefore described, and operating so as to produce the effect previously stated.

Second, The combination of the slot or mouth, K, in the arm, D, and the tenon, I I', at the ends of the corrugated rubbing bar, M, with the perforated bar, J, by which the portion of the said corrugated rubbing bar, M, may be altered with respect to the bottom of the machine, so as to increase or diminish its distance therefrom, substantially as set forth, and without altering the position of the bar, J.

Third, The combination of the corrugations on the lower surface of the rubbing bar, M, with similar corrugations on the bottom or concave of the machine, but so arranged that the direction of the two sets of corrugations will be at right angles to each other, as fully described, and for the purpose set forth.

24,755.—Peter Philip, of Ghent, N. Y., for an Improved Method of Operating Windlasses when Applied to Hay-presses, &c.:

I claim, first, Attaching the wheel or table, C, to the capstan, A, so as to be operated upon by the loose or boom-sweep, B, as a brake, for the purpose of stopping the press at any point of descent, while being filled, and of regulating and controlling the motion of the capstan in the uncoil.

Second, Providing the capstan, A, with the arms, e e', and the loose or boom-sweep, B, in combination with the check lever, D, substantially in the manner and for the purpose set forth.

24,756.—Daniel Quimby, of Littleton, N. H., for an Improved Machine for Boring Hubs:

I claim the shaft, A, the boss, B, placed on said shaft, and provided with a conical bore, d, and having the collar, p, and arms, q, attached, the screw rod, C, connected with the collar, p, by the gearing, n o, and providing with the divided nut, D, attached to the upright, f, the whole being arranged to operate substantially as and for the purpose set forth.

I further claim, in combination with the parts above-named, the convex projection, m, placed on the shaft, A, to operate as and for the purpose specified.

[This invention consists in the employment of an adjustable rotating clamp, stationary cutter and feed screw, so combined and arranged that hubs may be bored in taper form to receive their boxes, and the machine rendered capable of being adjusted to bore hubs of varying size, and with holes of greater or less taper as may be desired.]

24,757.—P. D. Richards and F. N. Thayer, of New Orleans, La., for an Improved Pocket Register of Count:

We claim the construction and arrangement of a hand-operating tally, specifically as described, consisting of three indexes and corresponding wheels to indicate count, as specified, the whole being operated by a projecting stud, G, and spring brake, I, with its gage, S, for the purpose set forth.

24,758.—John Richardson, of New York City, for an Improvement in Pen and Pencil Cases:

I claim the arrangement of the spiral grooved sleeves and their connection with the pen-holder and pencil, and also with the outer shell of the case, substantially as described, for the purpose as set forth.

24,759.—John Robertson, of Brooklyn, N. Y., for an Improved Hydrostatic Lifting Jack:

I claim the employment of the exterior movable hydraulic cylinder, E, with toe-piece upon its surface, in combination with the standard, B, which serves also as piston and eduction pipe, as and for the purpose shown and described.

24,760.—Wm. G. Russell, of Winchester, Va., for an Improved Self-detaching Whiffle-tree:

I claim a swingle or whiffle-tree, provided with a lever turn bar, e e e e f f g h h, as shown in Fig. 3, together with the spring clasp, o o, Figs. 1, 4, 5, and the hinged or jointed hooking ferrules, K K L L n n, when constructed and arranged substantially as set forth and described.

24,761.—Silas T. Savage, of Albany, N. Y., for an Improvement in Coal Sieves:

I laim the employment of the two half-globes, A and B, in which there are interstices, c c c, as a coal sifter, when said half-globes are provided with grooves, b b, tongues, a a, and shoulders, x x, the same being used in connection with a box or cylinder, by means of which the two portions of the globe are prevented from moving endwise of the trunnions and are prevented from separating, substantially as set forth.

24,762.—T. W. Schmidt, of Philadelphia, Pa., for an Improved Sawing Machine:

I claim the combined arrangement of the stationary frame, A, fitted with the adjustable holders, d e and n, as described, and the saw-carriage, B, operated by the crank, o, shaft, f', spur wheels, l, shaft, m, and rope or chain, as set forth and described, whilst the saw, k, is at the same time rotated through the media of the gear-wheel, f and g, pulley, h and i, and band, 7, arranged and combined as set forth and described, the said stationary frame, A, and the said moving saw-carriage, B, operating together as and for the purpose set forth and described.

24,763.—Cornelius R. Shaeffer, of Gettysburgh, Pa., for an Improved Machine for Making Hand-rails for Stairs:

I claim the combination of the perpendicular square post erected upon the base, A, with the draught-board, B, pitch-boards, B and G, rod, C, and arm, D, the several parts being arranged substantially as and for the purpose set forth.

24,764.—Reuben Shaler, of New Haven, Conn., for an Improved Confectionary Safe:

I claim the confectionary safe above described, constructed substantially as specified, as a new and useful article of manufacture.

24,765.—Geo. F. Shaw, of Woburn, Mass., for an Improvement in Corn-huskers:

I claim the combination and arrangement of the cylinder, A, and concave roller, C, substantially as set forth and for the purposes described.

24,766.—Christian Shunk, of Canton, Ohio, for an Improvement in Refining Iron:

I claim the use of the external crucible or hearth having the tweer pipe, C, the projecting stone, D, and the escape pipe, E, constructed as described, operating in such a manner that the blast shall deflect from the side of the upright stone and produce a rotary movement in the melted metal for the purpose of refining the same, as specified.

24,767.—Joseph [Siddall, of Philadelphia, Pa., for an Improvement in Threshing Machines:

I claim the combination of flails, F, roller, E, slides, C, and straps, g, when said flails are constructed with the flexible joints, J, the arrangement and operation being substantially as and for the purpose set forth.

24,768.—Michael Tromly, of [Mount Vernon, Ind., for an Improved Lock for Fire-arms:

I claim, first, The combination of the hooks, G2 I, or their equivalents, respectively formed on the claw, G', of the link, G, and the trigger, K, substantially as described.

Second, I also claim widening the upper end of the trigger, K, so as to form a projection, K1, in front, whose lower curved edge shall operate on the curved surface of the claw, G', in the manner and for the purpose set forth.

24,769.—J. L. G. Ward, of Adrian, Mich., for an Improvement in Artificial Stone:

I claim a cement composed of pumice-stone, silicate of soda, fluor spar and Roman cement, as set forth.

24,770.—Oliver N. Weaver, of Dover, Ky., for an Improvement in Preserving Cans:

I claim the perforated elastic plug, D d, secured in the top of a provision can, in the described combination, with a nozzle, E, and tube, F, communicating with an exhausting chamber, substantially as set forth.

24,771.—Loren Wetmore, of Tioga county, Pa., for an Improved Trap for Animals:

I claim the peculiar construction and arrangement of the manifold trap, substantially as set forth.

Second, I claim the arrangement of the trip, C, provided with a fulcrum or fulcra, c, guide pin, e, and arched wire, D, for operating the trap, substantially as set forth.

24,772.—James Wilson, Chas. Green and Wm. Wilson, Jr., of Wilmington, Del., for an Improvement in Attaching the Heads of Metallic Powder-kegs, &c.:

We claim the double seaming of both heads of the keg and the opening in one head, in the manner substantially as described.

24,773.—Arcalous Wyckoff, of Elmira, N. Y., for an Improved Hollow Auger:

I claim combining the transverse auxiliary cutters, d d, with the prime cutters, a a, and elliptic opening of the annular cutter-head, as described, substantially as and for the purpose set forth.

24,774.—Peter Altmair (assignor to himself and Myron M. Faxon), of Lewiston, Pa., for an Improvement in Breech-loading Fire-arms:

I claim, in combination with a fixed breech-piece, a hinged barrel, so arranged as that the said barrel shall swing upward and expose the chamber of the breech-piece, below the rear end of the barrel, for inserting the charge, substantially as described and represented.

24,775.—R. M. Campbell, of East Cambridge, Mass., assignor to himself and Benj. S. Wright, of Boston, Mass., for an Improved Money-drawer Alarm:

I claim the combination and arrangement of the two levers, F G, and the spring latch, E, with the clock-alarm apparatus, D, the striker, a, and bell, b, and the combination of the same and a series of perforated key slides and a set of T-bars applied together and to such levers so as to actuate the same, substantially as specified.

I also claim the combination and arrangement of the T-bars and the perforated key slides, to operate in manner as described.

I also claim, in combination with the key-lock, M, and the T-bar, I, a latching apparatus placed in the case, K, and constructed so as to lock both the cover and the T-bar, or either, substantially as specified.

I also claim the combination of the detector or indicator with the case cover and the T-bar, H, and operated in manner as specified.

24,776.—Saml. Green, of Lambertsville, N. J., assignor to himself and W. R. Green, of Philadelphia, Pa., for an Improved Safety Apparatus for City Railroad Cars:

I claim the swinging frame, C, in connection with the bolt, l, and cover, v, the brake blocks, D D, in connection with the chains, r r, and rods, t t, and the stationary supporting piece, n, the same or their equivalents being arranged, applied and operated substantially in the manner and for the purpose set forth and described.

24,777.—Samuel B. Guernsey, of Waterbury, Conn., assignor to W. H. Reed and G. W. Zeigler, of New York City, for an Improvement in Clasps for Skirt Hoops:

I claim connecting the hoops with the straps, or equivalents thereof, for connecting and suspending them by means of plates bent to embrace the hoops, and formed with two slots or apertures, through which the straps or equivalents pass, thus clasping the straps or equivalents to the hoops, substantially as described.

And I also claim the employment of the metal clasps, constructed as above described, in combination with and as a means of connecting the ends of the hoops, substantially as described.

24,778.—Moses Hall, Jr. (assignor to himself and S. H. Judy), of Osborn, Ohio, for an Improvement in Cattle Gates for Railroads:

I claim constructing a cable guard or gate, with its cross-bar or shaft below the rail of the railroad track, and operated by springs, substantially as described.

24,779.—Robert Law, of Lockport, N. Y., assignor to himself and P. T. Dix, of Olcott, N. Y., for an Improvement in Apparatus for Packing Fruit:

I claim the V-shaped or wedge-acting yoke, C, provided with fulcrum pins, h h, and the hooked recesses, g g, in the upper ends of the bent clamping levers, A A, arranged and acting in combination with the screw, D, fulcrum link, B, and claws, f f, or their equivalents, substantially in the manner and for the purpose specified.

24,780.—Sidney Parker (assignor to himself and Hugh Herringshaw), of New York City, for an Improvement in Sewing Machines:

I claim the combination of the hook, I, and the feeding arc, H, in the manner and for the purpose substantially as set forth.

I claim also the method of adjusting the feed, by means of the combination of the spring piece, G, and the feeding arc, H, in the manner described.

24,781.—John Paynter (assignor to himself and John McCorkle), of Shelbyville, Ind., for an Improvement in Sugar Mills:

I claim the combination and arrangement of the journal, C, wheel, D, gearing, E F G and H, and rollers, I J and K, the whole being suspended in a frame, A, and constructed and operated substantially as described.

24,782.—Asa T. Ring, of Newton, Mass., assignor to N. T. Spear and A. J. Robinson, of Boston and Milton, Mass., respectively, for an Improved Device for Winding Skeins of Thread:

I claim the combination of the clamping spring, c, screw and guide pin or rod, t t l, with the tightening and supporting shank, e, and bobbin, b, when said parts are constructed and arranged in relation to each other substantially as and for the purpose specified and shown.

RE-ISSUES.

754.—John M. Brunswick, of Cincinnati, Ohio, for an Improved Billiard-table Cushion. Patented Dec. 8, 1857:

I claim that order in the arrangement of the material composing a billiard table cushion which places the cork in the rear, the rubber in front of it, and the paper, leather and cloth, or the equivalents thereof, outside, in the manner and for the purpose set forth.

755.—L. Butler and R. Blake, of Waterford, N. Y., for an Improvement in Fire-engines. Patented Nov. 30, 1858:

We claim combining with the water way or channel, i, the air chamber, d, divided into two compartments by contraction, r, at or about one-half the hight of said air chamber above the base or point of attachment to said water way, substantially in the manner and for the purpose set forth.

We claim, in combination with the hour-glass contraction of the air chamber, the ring enlargement, S, of the rockshaft, as set forth.

756.—Austin G. Day, of Seymour, Conn., for an Improvement in Cleansing Caoutchouc:

I claim the use of alkali or its equivalent for separating bark, sticks or other foreign bodies from crude caoutchouc and other vulcanizable gums, to prepare them for manufacturing.

757.—Austin G. Day, of Seymour, Conn., for an Improvement in Treatment of Crude Caoutchouc:

I claim charging the caoutchouc, or other like gum, with alkaline liquor or the equivalent, by means of the exhausting apparatus described and represented.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves of Steam-engines. Patented March 10, 1849:

I claim the method substantially as described of operating the slide-valves of steam-engines, by connecting the valves that open and close the ports at opposite ends of the cylinder with separate crank-wrists or their mechanical equivalents, so that from the motion thereof each valve, while its port is closed, shall move a less distance than it moves in opening and closing its port, while at the same time the two wrists by which the two valves are operated, have the same range of motion as described, whereby I am enabled to save much of the power heretofore expended in working the slide-valves of steam-engines, and by which also I am enabled to make a greater proportion of the movement of the valve available for effecting a free passage of the steam through the ports of the cylinder.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves of Steam-engines. Patented March 10, 1849:

I claim the combination of liberating valve-gear with valves which are moved parallel to their seats, and continue their closing motion after their ports are closed, and commence their opening motion before their ports open, substantially as described.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves for Steam-engines. Patented March 10, 1849:

I claim the combination, substantially as described, of an air-cushion with the liberating valve-gear of steam-engines.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves of Steam-engines. Patented March 10, 1849:

I claim the combination with the part of the valve gear that appertains to a liberated steam valve of an instrument moved by the power of the engine in such manner as to effect the closing of the liberated valve whenever the independent means provided for that purpose fail to act in time.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves of Steam-engines. Patented March 10, 1849:

I claim the combination of a helical cam with the opening and closing mechanism of the steam valve, substantially as described.

George H. Corliss, of Providence, R. I., for an Improvement in Cut-off and Working Valves of Steam-engines. Patented March 10, 1849:

I claim the method, substantially as described, of regulating the velocity of steam-engines by combining a regulator with a liberating valve-gear.

Literary Notices.

THE COSMOPOLITAN ART JOURNAL, for June. Published at 548 Broadway, New York.

This excellent quarterly has, in its present number, a poor engraving of "The American Eagle guarding the Spirit of Washington," but the reading matter and wood-cuts redeem the number. A good article on "Greek and Roman Mythology," and an admirable likeness and notice of Charles F. Briggs (one of the *beaux esprit* of the New York press), are the characteristic features of this issue. This journal has great influence, and might, if it were more enthusiastic, do much for American art. We sincerely hope it will; for, of all things in this country, our greatest want is pictures for "the millions."

THE DENTAL NEWSLETTER for July, 1859.—This able quarterly, edited by Drs. White and McCurdy, and published by them at 528 Arch-street, Philadelphia, is one of the best works on dental science in this country. The editorials are well written, and full of valuable hints to the dental surgeon, while the communications from various sources form a complete mirror of dental science.

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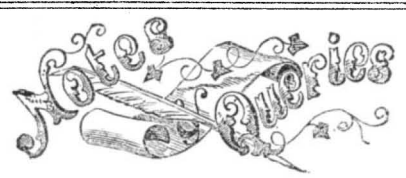

J. W. H., of Ga. (an old subscriber), informs us that he is desperately in want of a wife; but as we think proper to exclude that class of wants from our advertising page, we recommend our disconsolate correspondent to the columns of "Life Illustrated" (published by Fowler & Wells, in this city), as a suitable medium through which to make known his wants in the matrimonial line. To show our fair friends the characteristics required in all candidates willing to supply this want, however, we publish the following extract:—"I am in pursuit of a good wife, but cannot find one to my taste here. I want a woman who weighs about 120 lbs., who has black eyes, black hair, and fair skin, who is familiar with the kitchen, acquainted with the construction of puddings, sausages and shirts, partial to soap and scrubbing-brushes, and fond of children. She must neither wear hoops nor use snuff, and must never have been to any party, ball, or theater." Our correspondent adds that he is a mechanic in easy circumstances, and that he will take great care of any lady of the above description.

T. D., of Mo.—We have no expectations of ever seeing carbonic acid, either in the solid, liquid or gaseous condition, take the place of steam as a motive agent. The article to which you refer was from an eminent German chemist; he is evidently no engineer.

M. R. H., of Texas.—H. C. Baird, of Philadelphia, Pa., is publisher of a good work on distilling liquors. We do not know its price. There is no excellent treatise in our language on making wine; although in Dr. Ure's "Dictionary of the Arts" there is some good information on the subject.

J. A., of Ill.—We cannot give an entirely definite answer in regard to your chances of success by renewing your application unless we make a thorough examination at Washington. This service would cost you $5. Your letter, however, indicates that you withdrew your application for a patent six years ago. This withdrawal would doubtless be fatal to your renewal now with success. If a party suffers a thing to remain publicly exposed at the Patent Office, or elsewhere, for more than two years prior to an application for a patent, it is considered as an abandonment, and a patent is refused. This would be the light in which your new application would come before the Patent Office, and consequently you would be rejected. We should advise that you get up some new improvement, if you desire a patent. In regard to the patents granted subsequently to others, we say that they would be invalid, provided you could show that the same thing was made and used by you two years or more prior to the issue of said patents; otherwise those grants would remain valid. The mere fact that you had previously had the same idea would not vitiate them.

J. C. B., of Mass.—An English work called "Holtzappfel on Turning" will give you the information desired on cutting screws. It is too expensive for an apprentice like yourself. The gears on a lathe for cutting screws simply change the speed with which the cutter is advanced to change the pitch of the thread.

Q. L. M., of Canada.—Gold will adhere to steel by being beaten when laid on its surface. It was in this way that Damascus blades were ornamented.

P. E. G., of Cal.—You are right in using high pressure steam, and expanding it considerably in the cylinder of your engine. All the power which you can obtain in the cooling of water from a high to a low temperature is that of contraction; and we do not see how you can employ this principle to any useful purpose. Sixty cubic feet of water in cooling from 332° to 212° will contract to fifty feet.

T. C. B., of Ala.—The owner of a county patent right cannot make, sell, nor use his machines in another county, the right for which is owned by another party.

L. F. L., of N. H,—The employment of tubes for lightning conductors is quite a common and old application, but they are never filled with water, nor do we see what benefit can be secured by filling them with any kind of fluid.

A. W., of N. Y.—We cannot advise you to use a windmill for sawing lumber. You cannot depend upon its steady action either for this or any other purpose.

A. H., of Ohio.—There are many hand printing-presses which have feed and discharging devices attached. Some of them print on a continuous roll of paper which is cut into proper sized sheets as the impressions are given. Card printing-presses have been thus arranged. Many paper-feeding devices, capable of very general application, have been patented separately or apart from any particular form of press.

A. N. S., of Pa.—Durable leather varnish is composed of boiled linseed oil in which a drier, such as litharge, has been boiled; it is colored with lamp-black. This varnish is used for making enameled leather. Common leather varnish, which is used as a substitute for blacking, is made of thin lac-varnish colored with ivory black.

C. A. B., of Ala.—We do not know where you can find a description of the method to which you allude of transplanting large trees. No patent, so far as we know, has been issued for hurdles on which to draw them.

T. K., of N. Y.—We advise you not to expend any more time or money in pursuit of perpetual motion; it is a phantom—an impossibility.

G. W. M., of Mass.—We dissent from your opinion that the nitrogen of the air enters into combination with the blood in the lungs.

H. W., of Ohio.—The rotary-engine you refer to is a German invention, and not of much account. There is no proper test for the purity of silver but assaying it.

A. T. F., of Iowa.—The loftiest portion of the solid human frame is technically called the "cranium," a word derived from the Greek, signifying a helmet; but it is better known as the skull. Its form is that of an arch, the best shape to give strength, whilst the tenacity of its material is so great as to resist severe shocks in all directions.

W. F. S., of Ind.—It was a mistake in stating that Tredgold's work on the steam-engine cost $150. The amount should have read $50.

K. McN., of S. C.—A circus-rider, when standing on the back of a galloping horse, and occasionally leaping through hoops or over a banner, only jumps up; for having already the motion of the horse, he goes forward at the same rate as if he sat on its back; if he were to add to this the force of a leap forward, he would alight on the ground before the horse's head.

N. J. B., of La.—The reason why we hear workmen speak of "letting things down gently" is because velocity is attained by the distance of the fall. Thus, if a box of 100 lbs. weight was placed easily down on a floor no injury would accrue; but if dropped at a hight of an inch and a quarter, the momentum would make it fall with a weight of 200 lbs., or if at five inches, with a force of 400 lbs.

J. W. Van D., of Mich.—The common mode of blasting rocks under water is that of sinking cannisters of powder upon the reef or rock, which cannisters are connected by wires with an electric battery located at a safe distance away, either upon a boat or on the shore, and the powder is exploded by a current of electricity. In shallow streams only a small amount of force is exerted by this method of blasting under water; but at a considerable depth, the downward pressure of the water acts like a lever to make the powder exert its force downwards, and violently split the rock asunder. We are indebted to Professor Mallefert for the introduction of this mode of blasting rocks into this country.

J. L. H., of Minn.—The tensile strength of good boiler iron is 60,000 lbs. per square inch; the strength of any plate may be found out from this data. If it is 8-16 thick its strength is 30,000 lbs.; if ⅛, it will be 7,500 lbs. Make an allowance for the weakening effect of riveting by using 3 as a final divisor. By giving a valve lead in an engine about twenty-five per cent. of fuel is economised.

D. M. B., of Ind.—There is no such substance as the "oil of magnet." Those persons who told you there was such an oil, and that it could attract gold and silver, have been playing upon your credulity.

W. C. B., of N. B.—The composition for tipping matches consists of phosphorus two parts by weight, fine sand two parts, niter one part, and ocher one part, made into a paste with a solution of glue or gum, and colored with Prussian-blue. Copal—sometimes called Japan—varnish is made by pouring hot linseed oil upon fused copal resin, in an iron vessel, and then boiling them until the mixture becomes "ropy." To render it quick-drying, add a little litharge.

ASTRONOMER, of Ga.—Peters states that the sun, attended by all its planets, satellites and comets, is sweeping through space with a velocity which causes it to pass over a distance of 33,350,000 miles in every year.

N. D., of K. T.—You cannot distinguish hydraulic from other cement in the natural state. If you think there are deposits of it on your property, burn some specimens and test its qualities, and you can thus judge of its character. On page 245, Vol. XIV., SCIENTIFIC AMERICAN, you will find a method described of turning bells by pinion and spur-gearing similar to that which you describe. Common cloth buttons have their collets made of thin sheet iron varnished.

J. A., of Wis.—Mill picks are hardened in the ordinary manner. A great amount of information on the subject of tempering tools will be found in Vol. XII., SCIENTIFIC AMERICAN.

J. O., Jr., of N. H.—Blackie & Sons, of Fulton-street, this city, publish a good work on mechanical drawing. Write to them.

H. E. C., of N. C.—There is no truth in the statement that a method of collecting gold with pyroligneous acid has been patented. As to assisting you in buying machinery we will render you advice if you will call on us, but could not go around with you and make the selections. The coal oil patent question was fully discussed in our last volume. We cannot inform you of the number of manufactories.

O. J. Bollinger, of Cross Roads, York county, Pa., wants circulars of portable grain mills and mill machinery.

Money Received

At the SCIENTIFIC AMERICAN Office on account of Patent Office business, for the week ending Saturday, July 16, 1859:—

J. & S. N. D., of Ill., $25; S. & J. H. B., of Ill., $30; E. J. H., of Pa., $30; G. N. H., of N. Y., $27; S. B., of N. Y., $30; L. & W., of N. Y., $100; J. & H., of Cal., $25; E. D., of La., $110; J. N., of Ill., $32; J. B., of Pa., $25; F. A. B., of Conn., $25; F. M. R., of Pa., $35; A. M., of N. Y., $25; W. B., of Mich., $25; N. C. T., of Ill., $62; B. & B., of Ill., $30; Van V. & T., of N. Y., $25; G. S. C., of Ill., $25; J. S., of N. Y., $30; D. E., of Ill., $25; T. C. McK., of Tenn., $10; R. G., of Pa., $10; C. W. C., of Ill., $30; W. H. G., of Ill., $30; C. W. R., of Ga., $30; G. W. B., of Miss., $25; A. M., of N. C., $15; W. G., of Mass., $45; S. B. C. & Co., of N. Y., $100; C. A. D., of La., $60; L. K., of N. Y., $27; I. L. of Ill., $55; T. E., of Pa., $25; D. S., of N. Y., $30; W. D. J., of N. C., $90; G. C., of Ill., $55; K. & C., of Pa., $30; C. E. S., of Cal., $20; J. R., of La., $50; W. & F., of Mo., $30; A. C., of N. Y., $25; J. A., of Ky., $20; C. & H., of N. Y., $30; O. S., of N. Y., $30; J. D., of N. Y., $32; T. L. B., of N. Y., $25; W. T., of N. Y., $30; T. E., of Pa., $32; W. B., of Mich., $25; I. S. F., of N. Y., $55; A. K., of Ill., $30; S. B. C. & Co., of N. Y., $100; M. R., of N. Y., $200; J. G., of N. Y., $100.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 16, 1859:—

N. C. T. of Ill; Van V. & T. of N. Y.; J. D. of N. Y.; J. F. of Ky.; G. N. H. of N. Y.; L. K. of N. Y.; G. W. B. of Miss.; C. M. of N. J.; C. A. D. of La. (2 cases); J. P. S. of N. Y.; T. L. B. of N. Y.; J. & S. N. D. of Mich.; D. E. of Ill.; J. H. of Ky.; A. M. of N. C.; E. D. of La. (4 cases); G. S. C. of Ill.; J. N. of Ill.; W. A. S. of N. Y.; J. B. of Pa.; H. C. V. of France; C. W. R. of Pa.; R. D. N. of N. H.; C. L. of Cal.; J. & H. of Cal.; A. C. of N. Y.; F. A. B. of Conn.; W. G. of Mass.; W. B., of Mich.; T. E. of Pa.; R. G. of Pa.; A. G., of N. Y.

Valuable Hints to our Readers.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of our reception of their funds.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within the last fifteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

BINDING.—We would suggest to those of our patrons who have the last volume of the SCIENTIFIC AMERICAN complete, and desire to have it bound, that they had better send their numbers to this office, and have them bound in a uniform style with their previous volumes. Price of binding, 75 cents.

PRESERVE YOUR NUMBERS.—We often hear persons who have taken the SCIENTIFIC AMERICAN for the last dozen years, and preserved all the numbers since they commenced it, lamenting that they cannot procure the earlier volumes so that they may have the work complete. A few years hence there will be many who will regret they had not preserved the early numbers of the NEW SERIES; and that we may fulfill our whole duty to our patrons in this respect, we give them this early warning in regard to the first numbers of this volume. If the reader does not wish the numbers to bind for himself, undoubtedly, before the present year closes, the numbers can be sold at an advance above the cost, while he will have the benefit of a weekly perusal of the numbers which will cost him nothing. We counsel all to preserve their numbers.

Rates of Advertising.

Thirty cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining Patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. We also furnish a Circular of information about Foreign Patents.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly, CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully, Your obedient servant, J. HOLT.

Communications and remittances should be addressed to MUNN & COMPANY, No. 37 Park-row, New York.

PECK'S PATENT DROP PRESS.—THE MOST perfect machine in use for the manufacture of silver, copper or tin ware, spoons, jewelry, &c. Manufactured by the patentee.
4 22* MILO PECK & CO., New Haven, Conn.

BALL'S OHIO MOWER AND REAPER, AS IMproved for 1859, is the best and most saleable one made in the United States. For shop rights, Territory or machines, apply to
4 5* E. BALL, Canton, Ohio.

SPALDING'S PREPARED GLUE.—SAVE THE pieces—Economy—Dispatch! "A stitch in time saves nine." As accidents will happen even in well regulated families, it is very desirable to have some cheap and convenient way for repairing furniture, toys, crockery, &c. Spalding's Prepared Glue meets all such emergencies, and is always ready and up to the sticking point. It is just the article for cone, shell and other ornamental work. It is used cold, being chemically held in solution, and possesses all the valuable qualities of the best cabinet-maker's glue. "Useful in every house." N. B.—A brush accompanies each bottle. Price, 25 cents. Wholesale depot, No. 30 Platt-street, New York. Address H. C. SPALDING, box No. 3,600 New York. Put up for dealers in cases containing four, eight and twelve dozen, a beautiful lithograph show-card accompanying each package. Sold by all prominent stationers, druggists, hardware and furniture dealers, grocers and fancy stores. Country merchants should make a note of Spalding's Prepared Glue, when making up their Fall list. 4 4*

GREAT CURIOSITY.—WE HAVE ONE OF THE greatest curiosities and most valuable inventions in the known world, for which we want agents everywhere. Full particulars sent free. [4 5*] SHAW & CLARK, Biddeford, Maine.

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FARMERS, READ THIS.—"THE FARMERS' OWN PAPER."—THE GENESEE FARMER, a Monthly Journal of Agriculture nd Horticulture.—(Established in 1831.)—Published for twenty-eight years in one of the finest wheat nd fruit sections of America; it has attained an unrivaled circulation, and has able and experienced correspondents in every State of the Union and in the British Provinces. Each volume contains three hundred and eighty-four pages, and is profusely illustrated with expensive wood-cuts. It is sent to any address for Fifty Cents a Year! In order to introduce the FARMER into districts where it has few readers, we will take subscriptions to the coming half-volume (July to December inclusive) at the following rates:—Single subscribers, 25 cents: five copies for $1, and a copy of our beautiful 25-cent book, the "Rural Annual and Horticultural Directory," prepaid by mail, to the person getting up the club; Eight copies for $1 50, and a "Rural Annual," prepaid by mail, to the person getting up the club; sixteen copies for $3, and a "Rural Annual" and an extra copy of the FARMER for a year, or two for the half-volume, to the person getting up the club.

We also offer a liberal list of Cash Premiums as a still greater inducement to form clubs. Full particulars will be found in the paper, and everyone interested in the culture of the soil is invited to send for a copy, and, if pleased with the paper, to act as agent. Specimen copies sent free to all applicants. Address JOSEPH HARRIS, Publisher and Proprietor, Rochester, N. Y. 1 4*

STEAM COTTON FACTORY FOR SALE.—THE subscriber offers, low, for cash or approved paper, his large and well-appointed cotton factory at Herbertville, Harden county, Tennessee; also a large tract of woodland surrounding the factory. It is situated near the best cotton and provision markets of the South, and within two miles of Tennessee river, which is always navigable. Refer to James Gillespie, of the Machinist Association, Paterson, N. J.; J. T. Dawdall & Co., St. Louis, Mo.; or the subscriber at Herbertville, Tenn. [4 7*] C. L. HERBERT.

SPECIALLY ADAPTED TO THE NEWLY MARRIED.—"Home Whispers to Husbands and Wives." By Melva. 338 pp. 12mo., on fine paper, muslin, 75c.; gilt, $1, by mail, post-paid. This book, written by one of the best contributors to the "Advocate and Guardian," is made up of life-like sketches, well adapted to enforce the social duties and expose the incidental evils of married life. Address American Female Guardian Society, No. 29 East Twenty-ninth-street, New York. 4 1*

CHANCE TO MAKE MONEY.—THE RIGHT FOR the best monkey wrench ever invented will be sold low if applied for soon; or if not sold, a partner, with money sufficient to enter into the manufacture of them, would be taken; or a liberal arrangement would be made with some one to manufacture them.
4 1* ORIN O. WITHERELL, Fremont, N. H.

TO INVENTORS, PATENTEES AND MANUFACTURERS.—Geo. Kennedy, Pittsburgh, Agent for the sale of Patent Rights and the exhibition and sale of New Inventions and Patent Goods generally, invites the attention of all parties interested to the facilities thus offered for introducing and disposing of their productions. References—Cary, Howard & Sanger, New York; Erasmus C. Pratt & Bro., Philadelphia; Delius & Halven, Baltimore; Joseph C. Butler & Co., Cincinnati; and merchants generally, Pittsburgh. Permanent agencies and occasional consignments solicited, strict attention paid to the interests of owners, and all reasonable efforts made to give general satisfaction. Communications by mail promptly attended to. Address, with full particulars, GEO. KENNEDY, box 599 Post-office, Pittsburgh, Pa. 4 2*

HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam-engines of all sizes, suitable for said Mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York 1 e3w

JOHN W. QUINCY & CO., IMPORTERS AND Dealers in Metals, &c., No. 98 William-street, New York. Banca Tin, Spelter, Ingot Copper, Lead, Antimony, Babbitt Metal, Mount Hope Cut Nails, Ames' Shovels and Spades, &c. 12 e5w*

FRANCIS T. HOLLEMOEGER, MODEL AND Pattern Maker, No. 216 William-street, New York City. 1*

AMERICAN RAILWAY TIMES—ESTABLISHED IN 1849.—Devoted to the Construction, Operation, Management and Finances of Railways; Machinery, Civil and Mechanical Engineering, Railway Law, Iron Manufacture, Movements of Capital, Money and Stock Market, &c., &c. It likewise contains a very full United States Railway Share and Bond List, corrected every week, showing the miles open, capital stock, funded debt, cost, receipts and net earnings, dividend, and the latest current prices of stocks nd bonds of most of the Railways in the country. The extensive circulation of the RAILWAY TIMES among Railway Superintendents, Presidents, Directors, Stockholders, Master Mechanics, Car and Track Masters, Contractors, Locomotive and Car Builders, Machinists, Civil, Mechanical and Locomotive Engineers, Manufacturers, Supply Agents, Bankers, Capitalists, Brokers, and others throughout the country, renders it an unequaled medium for Advertising. JOHN A. HAVEN, Editor and Proprietor,
Subscription price, $3 per annum. [1 4*] Boston, Mass.

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Having used F. K. Sibley's Improved Emery and Crocus Cloth for the past year, I fully concur in the above statement.
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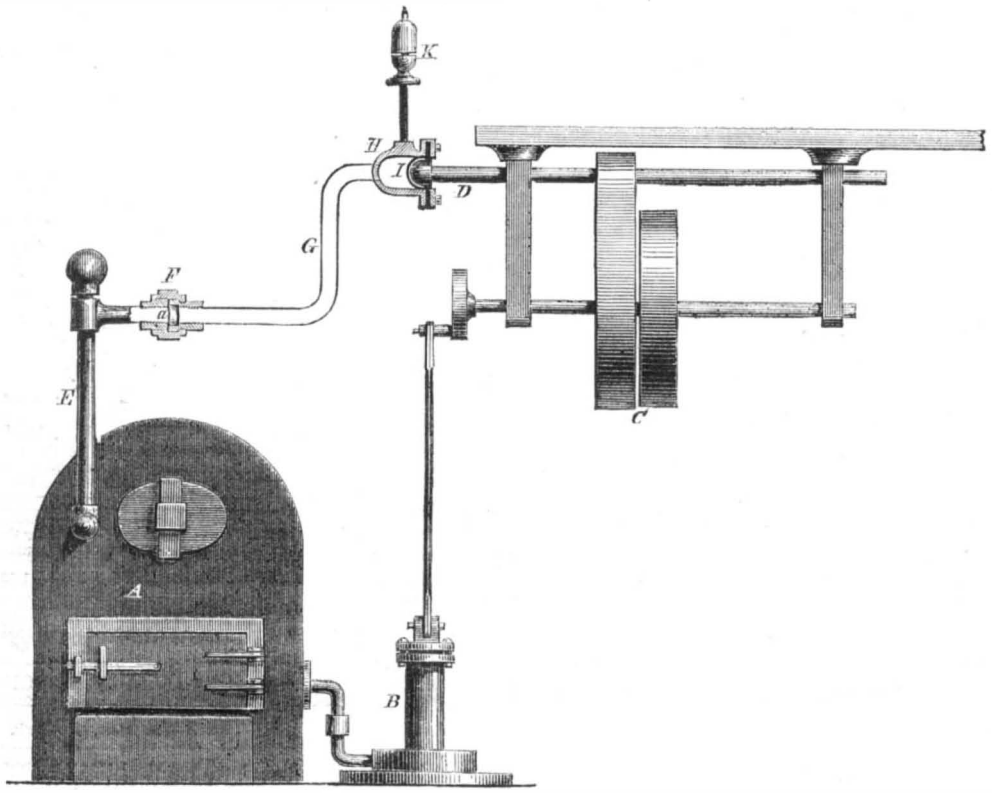
LOW WATER INDICATOR.

When an engineer or stoker is careless, there should be some method of preventing an accident, and of announcing the fact of his negligence to the proper person, that he may be reprimanded or discharged as the occasion may require. Our illustration shows an apparatus by which a deficiency of water in the boiler is prevented, and the moment the water gets to a dangerous point is announced. It is the invention of Messrs. J. W. Hoard & G. B. Wiggins, of Providence, R. I., and they are taking steps to secure a patent. To any of the various forms of boilers, A, a pipe, E, can be attached, so that the water in the boiler can communicate with it and pass into it to the same level as it is in the boiler or higher, but the water in E cannot pass the plug of fusible metal, *a*, that is placed in the seat or socket, F. B is the pump by which water can be fed to the boiler, and the pump rod s operated by a pin on a wheel that carries fast and loose pulleys, C, on its shaft, so that the pump can either be operated or not by a bolt that is constantly running.



HOARD & WIGGINS' LOW WATER INDICATOR.

To render the whole clear, we will at once describe the operation of the apparatus, in case of the liability of an accident. Let us suppose that the stoker or engine-driver has allowed the water in the boiler to fall below the connection of pipe, E, and the boiler; the steam instantly rushes in the pipe, and from its superior heat to the water, it melts the fusible metal plug, *a*, and passes up the tube or pipe, G, into the chamber, H, from which it sounds the whistle, K, and pressing against the diaphragm, J, presses that out, and so operates the belt-shipper, D, causing the belt to be moved from the loose to the fast pulley, when it instantly works the pump, B, and the defect is remedied before any dangerous consequences arise.

The inventors will be happy to give any further information upon being communicated with.

PLEASANT DRINKS.

In this hot weather every one wants some cooling pleasant liquid, which they can imbibe to compensate for the perspiration, and to appease the thirst a high temperature induces, we therefore give a number of recipes from which every one, we should think, could find one to suit their palate:—

SPRUCE BEER.—Spruce is a powerful anti-scorbutic, and should be used freely by persons who have a tendency to that affliction. It acts with some as a diuretic. Here is a recipe for making it—Provide sixteen gallons of water, boil half of it, and put the other half of it into a barrel, pour the boiling water to the cold in the barrel; then throw in six tablespoonfuls of essence of spruce, and sixteen pounds of molasses; when sufficiently cold, add half a pint of yeast, and roll the cask about, or shake it well. Keep it in a warm place for two days, with the bung open; by this time the fermentation will have subsided sufficiently for bottling. Bottle it, or put it into stone jars well corked, and it will be fit for use in a week. Another—Add eleven gallons of boiling to ten of cold water; to this put thirty pounds of molasses, and one ounce and a half of essence of spruce; work with yeast, and bottle as above. If you wish your spruce beer to be white, use refined sugar instead of molasses.

EXCELLENT PORTABLE LEMONADE.—Rasp, with a quarter of a pound of sugar, the rind of a fine juicy lemon; reduce the sugar to a powder, and pour on it the strained juice of the fruit; press the mixture into a jar, and when wanted for use dissolve a table-spoonful in a glass of water; it will keep a considerable time. If two sweet for the taste of the drinker, a very small portion of citric acid may be added when it is taken.

LEMON AND KALI, OR SHERBET OF THE SHOPS.—Ground or finely powdered white sugar, half a pound; powdered tartaric acid and carbonate of soda, of each a quarter of a pound; essence of lemon, thirty to fifty drops; all the powders should be well dried; add the essence to the sugar, then add the other powders, and mix well. One teaspoonful in a tumbler of water. This preparation must be kept very dry in tightly-corked bottles.

GINGER BEER, No. 1.—A VERY SUPERIOR KIND.—White sugar, five pounds; lemon juice, one quarter of a pint; honey, one quarter of a pound; ginger bruised, five ounces; water, four gallons and a half. Boil the ginger in three quarts of the water for half an hour; then add the sugar, lemon juice, and honey, with the remainder of the water, and strain through a cloth; when cold, add the quarter of the white of an egg, and a small teaspoonful of essence of lemon; let the whole stand four days, and then bottle. This will keep many months.

GINGER BEER, No. 2.—White sugar, three pounds; bruised ginger, three ounces; cream of tartar, one ounce; four lemons shred; boiling water, four gallons; allow the whole to soak for two hours, then strain; add eight ounces of yeast, and, after a few hours, put into tightly-corked bottles.

GINGER DROPS.—These excellent stomachic drops may be thus prepared:—Cut into little bits an ounce of candied orange peel, and put it with the same quantity of sifted loaf sugar into a mortar. Beat and rub both together until they form a smooth paste, when you must add to them an ounce of pure pounded ginger, and half a pound more sugar. Work the whole together in the mortar, and add sufficient water to dissolve the sugar, rubbing the mixture well up together; then put it into a saucepan, boil it up to a caramel, and drop it in large drops upon clean writing paper.

COMPARATIVE LONGEVITY.—In the French *Revue Encyclopedique* are some interesting statements on longevity, and the proportion of deaths to the population, in the different countries of Europe. According to the data here presented, the duration and value of human life varies much between one European nation and another. The British islands, and especially Scotland, appear to be very favorable to the life of man; in a million of inhabitants, the annual deaths are somewhat more than eighteen thousand. Sweden and Norway are also salubrious climates; there are only two deaths in that part of Europe for three in the southern countries. In Denmark and the greater part of Germany, the proportion is about the same. Russia and Poland, where the mass of the inhabitants may be said to have scarcely the necessaries of life, are astonishingly favorable to the continuation of existence; the population lives, on an average, half as long again as the Italians, and exactly twice as long as the inhabitants of Vienna. The mean rate of mortality is in Switzerland, in the provinces of the Austrian empire, and in Spain, in which countries the annual deaths are about one in every 40. France, Holland, Belgium and Prussia do not vary much from the same proportion. In other parts of Europe, the deaths are one in 30, and often more in the countries that border on the Mediterranean Sea.

REFUSE OF TANNERIES AS MANURE.—At a late meeting of the Farmers' Club, of Little Falls, N. Y., the subject of using the refuse of tanneries (hair, fleshings, lime, &c.) for agricultural purposes, was discussed, and one member said he had used hair on grain and grass with the most marked effect. He had spread it thinly and harrowed in with spring wheat, and, produced the best crop he had ever raised or seen in the neighborhood. Upon grass its effects had been very distinct and lasting. Applied upon the top of an unproductive dry ridge of land, it had produced a very luxuriant growth, and without any other application, the dark green complexion of the sward had scarcely abated in ten years.

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To the Mechanic and Manufacturer the SCIENTIFIC AMERICAN is important, as every number treats of matters pertaining to their business, and as often as may be deemed necessary a column or two on the metal and lumber markets will be given; thus comprising, in a useful, practical, scientific paper, a Price Current which can be relied upon.

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